I, No. 1 October, 1945

CHEMICAL CORPS JOURNAL

Official Publication of the Chemical Warfare Association
Washington, District of Columbia

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Chemical Corps Journal

OFFICIAL PUBLICATION OF THE CHEMICAL WARFARE ASSOCIATION
2153 Florida Avenue N.W. Washington, D. C.
Lt. Col. HAROLD B. RODIER, *CC, Ret.*, Editor

Vol. 1 OCTOBER, 1946 No. 1

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THE PICTURE ON THE COVER

The cover picture shows a 4.2-inch mortar in action in Bougainville. It is attacking Jap positions from a point near the Laruma River.

This subject is considered timely in view of the widespread interest in the 4.2 aroused by the Mead Committee's attack on this great weapon.

INDEX

Biological Warfare	26
Chapter News	57
Chiefs Salute CWA	10
CWA Comes Into Being	14
Cooperation Is Keystone	17
Crossroads Able and Baker	46
Directors at Large	13
Doin's at Detrick	56
Editorials	6
Emergency Preparedness	22
Executive Committee	53
Famed 4.2 Rides Waves	44
First Meeting	15
Future of Chemical Warfare	18
Group Members Back CWA	33
History of Edgewood Chapter	54
National Officers	34
Men and Women of CWS	27
Navy Praises Corps	13
Objectives	16
Peacetime Implications of Biological Warfare	36
President's Message	5
RA Commissions to Chemical Officers	43
Research and Industry	18
Research for Military Purposes	30
Revitalized Procurement Planning	28
Secretary's Corner	52
War Mobilization	20
Were Japs Defeated by CWS Incendiaries?	41
Why Prepare?	24

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INDEX TO ADVERTISERS

Acushnet Process	63	National Fireworks	65
American Cyanamid	9	National Foundry Co.	45
Bell Machine	66	National Magnesium	2
Buffalo Electro Chemical	61	Niagara Alkali	19
Dow Chemical	68	Pemco Corp.	47
General Tire & Rubber	67	Prescott & Co.	65
Gittings Auto Service	45	Professional Directory	29
Handy & Harman	39	United Iron & Metals	65
Hooker Chemical	21	Vulcan Copper & Supply	64
Industrial Rubber Goods	55	Wallace & Tiernan	25
Lambert Pharmacal	42		

Chemical Warfare Association

Primary Mission:

The members of this Association, mindful of the vital importance of chemical warfare in the field of national defense, have joined together as a patriotic obligation to preserve the knowledge derived from their war experiences and to encourage improvements in science as applied to the Chemical Warfare Service. The objects of this Association, therefore, are to sponsor new developments designed to increase the efficiency of chemical warfare means, to collect and disseminate useful knowledge with respect to chemical warfare and related subjects, to foster a spirit of good will and cooperative endeavor among its members and with industry, and to perpetuate the friendships, memories and traditions growing out of their service with the Chemical Warfare Service. The members of this Association and its constituent local Chapters are mutually pledged to the furtherance and promotion of these objects.

Membership Eligibility:

Any person who is or may be assigned or detailed to duty with or in the Chemical Warfare Service, whether as officer, warrant officer, enlisted man or civilian employee, or who has been honorably discharged from such duty, and any person interested in the promotion of chemical warfare preparedness for national defense, may upon approval of the Executive Committee and payment of the annual dues hereinafter specified become a Regular member of this Association.

(*If you are not now a member, fill in the following application and mail*):

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A Message From Your National President

Never again can you correctly refer to *our* U. S. Army in the third person. Whether you like it or not, you are on a civilian furlough only until our country is forced into another defensive conflict. It's full time we recognize this irrefutable fact—accept the associated responsibilities and direct our future activities accordingly.

In ancient history small complements of professional soldiers provided the fighting and protection for comparatively large masses of civilians. However, in this modern age our Regular Army is a mere nucleus of a war-waging Army. Our peacetime Army serves to develop improved strategy, new weapons, etc., but we civilians and industry win the wars. In World War II the ratio of civilians to Regular Army personnel was over eighty to one. It is our Army in which we must fight to protect our country in times of emergencies. Why, then, should we divorce ourselves from its requirements, its activities and its welfare during times of peace? To ignore our responsibility in guiding its destiny constitutes the abandoning of our national security. In case of war, do we elect to return to an effete, emasculated, remnant army—or a powerful, well-organized and fully-equipped war machine? That is for us to decide—and now!

World War III will unquestionably bring to this continent the most devastating, death-spreading form of warfare the human mind can conjecture. Our very homes and families will be in the midst of the battlefield and subjected to horrors heretofore unimaginable. Present developments point to a war of guided missiles armed with warheads of atomic energy, disease and germs to infect tremendous areas and populations, and atomic gases capable of completely inactivating entire cities.

How, then, can we afford to adopt an attitude of indifference towards the status of our Army? How can we truthfully say it is no affair of ours, but one for the legislature and Regular Army to solve? If we will expect our Army to protect our lands, homes and families, then it is our perpetual duty to contribute full support. It befalls us to maintain its standards and prestige at the highest levels—its ranks filled with intelligent, resourceful men; its arsenals supplied with the newest, most effective weapons; and its budget adequate to provide extensive research and development work on new materiel.

It is of essential interest to our Army's future that you join and become active in that military association which most nearly reflects your civilian activities. In this manner, you can now have a voice in shaping the future of *your* Army.

LUDLOW KING.

Lt. Col. Alex Leggin, Cml. Res.
Public Relations Officer

Alex Leggin, one of the youngest lieutenant colonels in CWS, served with distinction in ETO. He is now Associate Editor for the American Chemical Society Chemical and Engineering News, covering the Washington waterfront. As our Public Relations Officer, he is responsible for guiding and counseling the Executive Committee on publicity policy and for dissemination of news concerning the Association. Al is a bachelor and lives at the Dorchester House in Washington, D. C.

Charles E. Pledger, Jr., General Counsel, is a Washington lawyer, and entered the service in November 1942. He served at Edgewood Arsenal until August 1946, when he was transferred to the Chief's office as Chief, Legal Division. A graduate of George Washington University Law School, he is a member of the Bar Association, District of Columbia; American Bar Association; The Barristers', Lawyers' Club, and the International Association of Insurance Counsel. He lives with his wife and two daughters at 1715 Crestwood Drive N.W.

Major Charles E. Pledger, Jr., Cml. Res.
General Counsel

". . . to sponsor new developments designed to increase the efficiency of chemical warfare means, to collect and disseminate useful knowledge with respect to chemical warfare and related subjects, to foster a spirit of good will and cooperative endeavor among its members and with industry, and to perpetuate the friendships, memories and traditions growing out of their service with the Chemical Warfare Service . . ."

The Chemical Warfare Association

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Washington, D. C.

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Vol. I OCTOBER, 1946 No. 1

SPIRITUAL MOBILIZATION

WHEN you put your five dollars on the line and come up with the little card which certifies that you are a member in good standing of the CHEMICAL WARFARE ASSOCIATION, you have made a bad deal if your object was to profit by the transaction, in any material sense. For you are a member of our Association not for the sake of what you get out of it, but for what you put into it.

When you entered the service of your country in time of war, whether as a soldier, a scientist or as an industrialist, you assumed a burden of responsibility which you can never fully lay aside. You have attained an awareness of the deadly seriousness of war and the fearful responsibility which lays upon our people for the avoidance of new wars by material and spiritual readiness to defend peace. You are in this Association because you hope and believe that it affords a means whereby you may contribute whatever lies in your power toward the cause of peace.

The almost indecent speed with which our people dropped the pursuits of war and hastened to achieve a resumption of a normal, peaceful life, appears today to have been a major error of judgment. We may have laid down our cards before the hand was won. Our military potential is being continuously appraised by the rest of the world, and our power to shape the world in which we live is greatly predicated upon their estimates. Physically, America has demobilized. If we have demobilized spiritually, then we are no longer the major force in the establishment of a new Europe and Asia. This Association avows its conviction that America has not lost its spiritual strength; your connection with our Association is an avowal of your own faith and a dedication of yourself as an element in that strength.

We are prone to refer to American military strength in terms of "the next war," or a "possible World War III." But the striking thing is the importance of our military strength as a factor in World Peace. Few are convinced that the world is yet possessed of enough wisdom and morality to abandon war as a political and economic instrument, or even that this happy era is close at hand. Paradoxically, we can only maintain peace by being ready and capable of waging a victorious war.

America's failure to collectively realize this, after World War I, was in no small part the cause of World War II. Another such failure would make World War III inevitable. It is lamentable that our peace-loving people can only assure themselves of peace by being alert and poised for possible war, but it *is* a grim fact which we must accept and with which we must live. It is a fact which must qualify our lives, collectively and individually. It is a fact which we would forget or ignore at our peril.

Acceptance of this realistic appraisal of the situation may be described as "war-mongering" by the pacifists; but it is precisely pacifism that engenders wars.

America has just emerged as a victorious survivor of a war for which we were not prepared. It may not be possible to assert positively that this war would have been averted had America been prepared; but can be stated unequivocably that we can never hope to survive as victor of another war for which we are not completely prepared in every respect.

In this war we had nearly two years in which to translate our potential strength and our almost limitless resources into effective striking power. In another war we might have two weeks.

Should there be a World War III, it will be the quick assets that count. You are such a "quick asset," whether you be soldier, scientist or industrialist. You are trained and experienced in one, perhaps the most significant phase of war—Chemical Warfare. You are deeply aware of its military potentiality, alert to its revolutionary possibilities in an era in which war is the most revolutionary activity of society.

You know that Chemical Warfare comprises

the most dynamic phases of the arts of war. And you fully appreciate that it is singularly necessary that Chemical Warfare be a living, evolutionary art; geared constantly to the world of tomorrow. Only thus may it be prepared to accomplish its mission, when called upon.

We recognize the incongruity of refraining from the use of poison gas during World War II, for reasons of "humanity," while at the same time unloosing a ceaseless stream of death and destruction on the civilian populations, including women and children, and climaxed by the use of the atomic bomb. World War II was no exception to the rule that every war is more destructive, more terrifying, more cruel and more bitter than the wars which have gone before. The Chemical Warfare Association, therefore, assumes the probability that a new war will be a war of atomic bombs, atomic gases, directed missles, lethal gases and bacteriological warfare. Research and development relating to this last, terrifying phase of war is a function of the Chemical Corps.

As a major element in our national defense, it is not enough that Chemical Warfare keep abreast of the times in terms of the skeletonized military laboratory and Army cadre. Chemical science, chemical industry, and a potential army of Chemical Corps personnel must be capable of mobilization at lightning speed, without fumbling or confusion. The continued association of these elements of a war-time Chemical Warfare establishment, through the medium of our organization, is an invaluable and practical means of assuring this end.

The Policy of The Journal

The mission of The Journal will be to promote the objectives of the Association. Your Editor believes that our members have associated themselves with the organization for the following principal reasons:

1. Having taken pride in their branch of the service and satisfaction in the friendships formed therein, most of our members are happy to be able, through the medium of this organization, to maintain some contact and connection with their friends and associates in the Chemical Warfare Service.

2. Through their reserve commissions, their being subject to recall to the military service at any time until the official termination of the emergency and, far more importantly, from their conviction that every soldier, commissioned or enlisted, every civilian technician, and every industrialist in the chemical and allied industries will be called upon to serve the Chemical arm of the service in any future threat to our national safety; our membership is persuaded of the personal importance of their keeping abreast of Chemical Corps trends, requirements and activities.

3. Our Association is capable of making a vital contribution to the cause of national defense by maintaining an unbroken liaison between the Chemical Corps, the War Department, chemical science, the chemical industry, and the personnel composing these elements of a national chemical defense. We saw the grave dangers which followed the rapid and extensive drifting apart of these elements at the termination of World War I, and we foresee a critical danger should there be a similar disintegration of the army-industry war machine at this time. Our Association is designed to maintain these relationships in workable fashion, and to be a medium for the mutual information of all of these related elements.

It is believed that The Journal can play an important part in furthering the mission of the Association. It will carry as many personal items about you and your friends of the Service as can be obtained. You are urged to send in such personal items. It will keep the membership always currently informed on the activities of the Chemical Corps to the fullest extent compatible with security. We expect to be able to overcome the traditional reluctance of the Army to disclose information about its thinking and planning, by convincing them of the positive gain to be realized by a policy of frankness and confidence when dealing with the individuals and organizations with whom they must operate in time of war.

What's in a Name?

Your Association is incorporated under the name of the Chemical Warfare Association; and under its constitution it is necessary that a change in the name be approved by the full Directorate, which includes all Chapter presidents. For this reason it will be necessary to operate under this name for some time, although with the change in name of the Chemical Warfare Service to the Chemical Corps it is inevitable that our Association follow suite. We have given our publications, however, their permanent nomenclature.

Journal Is Association, Not W. D., Organ

In the beginning it is timely to clarify to the readers of the Chemical Corps Journal the unofficial and non-army status of the Chemical Warfare Association and its publications. Its membership and pages are open to RA's, RO's and NG's, EM's and Industrialists. There is no official tie-in with the War Department, the Army or any branch of the Service. Editorial opinions

as well as attitudes expressed by the authors of articles, have no sanction of the combat services and do not necessarily reflect the current official views of the War Department. We call attention to our status in the initial issue, because of past misgivings; we want all to understand that our future editorial policy will not resemble the minutes of a mutual admiration society, but will treat of the deficiencies as well as the achievements of our Branch in the winning of World War II.

To enable us to aid our country in the future we must analyze our accomplishments and deficiencies of the past. Both have been numerous, brilliant and glaring. As editorial pens cut through the smoke screens of "military censorship" some brilliant incendiaries will appear along with some fizzling smoke pots. At times the comments as well as the authentic observations may irritiate the roseate outlook of the powers that sit amid the heights of Olympus. So be it, let the shells fall where the charges carry them. Objective facts and history and research will be our aim and not the opinions of untouchable or irresponsible individuals. An honest discussion of past lessons will do much to advance our cause in the future.

Dipping into the duffle-bag, we come up with—

"The preservation of peace is dependent on the ability to make war."—Vice-Adm. Marc A. Mitscher.

—J. H. C.

MEAD COMMITTEE INVESTIGATIONS

The Executive Committee of your Association met early in August to consider the effect of the Mead Committee's activities upon the Chemical Warfare Service and the future Chemical defense of our Nation. This committee was unanimously of the opinion that insofar as the Senate investigation might disclose evidence of wrongdoing or gross mismanagement in the operation of our Service, or any other Service, that it was a wholly desirable thing to which we subscribed without reservation. But it was further unanimously their opinion that the Mead investigation had been conducted, with reference to the Chemical Warfare Service, in a manner that left much to be criticized. It was believed that there was an evident interest in creating sensational "news" without regard for accuracy, fair play, or the national interest.

The Association therefore decided to take action with a view to correcting some of the misinformation with which the public had been supplied and repairing some of the damage done. It was decided to place most of the emphasis of our efforts upon the attacks upon the 4.2 mortar, believing that widespread destruction of public confidence in this great weapon was a vital blow at the Nation's defenses. Accordingly, a series of news releases was prepared and an entire issue of the *Chemical Corps News* devoted to supplying corrective information on the 4.2 mortar and its ammunition. The membership of our Association was asked to assist in publicizing this information. A considerable amount of favorable publicity was thus secured, including much helpful editorial comment.

In largely confining its efforts to the 4.2 it was not the thought of your Association's committee that it was only with respect to the 4.2 that the Mead Committee had been guilty of distortion and unfairness. It was believed that there had been much unfairness, much overemphasis upon matters of little consequence, and a thoroughly unjudicial attitude upon the part of the committee. But it was felt that the most good could be accomplished by singling out one particularly vicious phase of their unfair attitude and answering this in detail. Having demolished one phase of their attack, it was felt that the public would be able to fairly evaluate the nature of some of the other elements of their attack.

The Journal deeply deplores that this investigation was not conducted in an impartial and reasonable manner, for not the least damage done by their palpable play for sensational publicity without reference to the facts involved is the public loss of confidence in the integrity of the investigations they are conducting. The history of this committee has been long and honorable. It is to be hoped that under new leadership it will regain the place in public confidence it formerly held.

CWS NEEDS FRIENDS

(Reprinted from *Chemical Engineering*, August 1946.)

Chemical industry and the chemical profession now have a special task that urgently needs doing. This is the selling of Chemical Warfare Service to Congressmen and the rest of official Washington. Perhaps never before has it been so urgent that we make clear the long-time fundamental importance of CWS as a unit of military preparedness.

This new need arises from the fact that several important commissioned officers of that Service have been drawn into various phases of the Mead Committee investigation. We do not pretend to know, or to interpret, the real significance of those matters. That is a job for the investigators. But it is our task to point out the fact that whatever has been done by individuals, there is nothing which has changed the fundamental importance of chemical warfare as a part of military research and of the United States Army.

One of a series illustrating Cyanamid's many activities.

...far More than a Selling Point

As many home owners know, Clean Coal means more heat, less ash and fewer clinkers. To the industrial user, it means higher b.t.u. content and greater freedom from slate, bone, rock and sulphur. Hence, the cleaner the coal, the more value it gives—an important selling point in a highly competitive market.

But to the coal producer, efficient cleaning of coal is far more than a selling point. It conserves resources, speeds production, prevents waste, and permits high grade coal to be obtained from low grade deposits.

Thanks to the adaptation of Heavy Media Separation to this purpose by Cyanamid's Mineral Dressing Division, greater efficiency has now been attained in the cleaning of coal. By these processes, refuse is separated by simple gravity in a fluid medium of finely ground magnetite suspended in water. By controlling the specific gravity of the medium, the coal floats while the refuse sinks. This method can be used for all types of coal—and from fines to large-size lump. Yet it's a simple operation requiring only standard equipment...and the medium is automatically reclaimed. The specific gravity of the medium can be changed quickly and easily without shutdown or loss of coal or medium.

Heavy Media Processes have been used with outstanding success in the beneficiation of ores. By adapting them to the cleaning of coal, Cyanamid is helping to utilize seams heretofore considered too low grade to work, while making greater yields of cleaner coal available at lower operating costs. And it meets the coal industry's need for better and more economical cleaning as mechanized mining increases. This is another case where Cyanamid service benefits both industry and the public.

American
Cyanamid Company
30 ROCKEFELLER PLAZA, NEW YORK 20, N. Y.

MOLDING THE FUTURE THROUGH CHEMISTRY

Chiefs Salute Chemical Association

Hon. Robert P. Patterson
Secretary of War

WARTIME CHIEF, GENERAL PORTER HAILS NEW ASSOCIATION

The Chemical Warfare Association is the realization of a dream as old as the permanent status of the Service itself.

No part of the Army is more in need of the close liaison with science and industry which such an association can provide; and I am happy to think that no part of the Army can contribute more in return.

Some 10,000 officers, 60,000 soldiers and 50,000 civilians, under our banner with its strange device, implemented Chemical Warfare Service's war effort. The Secretary of War in an address at Atlantic City a few weeks ago told how well their jobs had been done. The contacts this force can provide must not be lost.

The Association has been brought into being at the time when the Chemical Warfare Service can work forward to its greatest usefulness in national defense with a fine record behind it on which it can stand with confidence and pride.

(Continued on page 62)

SECRETARY PATTERSON GREETS THE JOURNAL

The appearance of this new Journal, published by a group of industrial scientists and former military members of the Chemical Warfare Service, fills a great need. This branch of the Army first won recognition when hastily formed Chemical Warfare units in World War I met with marked success in helping to roll back the gas attacks of the Germans. Although the civilian and military scientists of the Chemical Warfare Service were active on painstaking and time-consuming research problems during the intervening peace years, all too little was known of their humanitarian developments and projects designed for our national chemical preparedness.

At our entrance into World War II, it was determined that Chemical Warfare Service would play the role of a national protective service, similar to a life insurance policy. It was to be ready for any use of gas by the Axis nations, and

(Continued on page 62)

Maj. Gen. William N. Porter, Ret.
Wartime Chief, CWS

CHIEF OF STAFF EXTENDS GOOD WISHES

WAR DEPARTMENT
THE CHIEF OF STAFF
WASHINGTON

DEAR COLONEL RODIER: It is a pleasure to extend greetings and good wishes to the members of the Chemical Warfare Association. Established as it is to perpetuate friendships and traditions among those associated in war with the Chemical Warfare Service and to promote our national security for the future, your organization assures continuing contact between the Regular Army, the reserve components, chemical science and industry in peacetime.

This is an essential security function because the increase in the responsibilities and activities of the Chemical Warfare Service in World War II presages its increasing importance as research and development continue to improve our weapons and methods.

Such an association as yours, composed of men and women of demonstrated patriotism and capacity, can perform services in peace of incalculable value to our country. Your objectives are important and your means of attaining them are practical. I shall watch your growth with keen interest.

Sincerely,
DWIGHT D. EISENHOWER.

Lt. Colonel Harold B. Rodier,
Editor, Chemical Corps Journal.

Maj. Gen. Alden H. Waitt
Chief, Chemical Corps
Honorary President, Chemical Warfare Association

General Dwight D. Eisenhower
Chief of Staff, U. S. Army

CWA CAN MAKE VITAL CONTRIBUTION, SAYS GENERAL WAITT

OFFICE OF THE CHIEF
CHEMICAL CORPS
WAR DEPARTMENT, WASHINGTON, D. C.

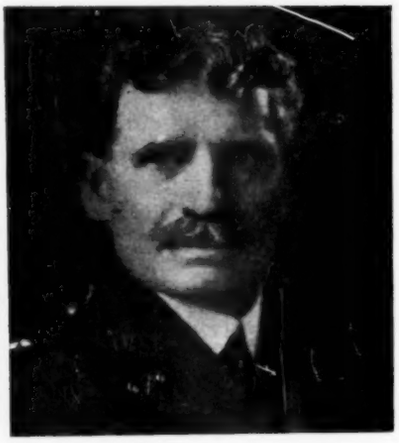
It gives me particular pleasure to have this opportunity of extending to the membership of the Chemical Warfare Association my cordial greetings and my appreciation of your decision to undertake an important mission in the cause of our national defense.

It has become clear to most Americans that the defense of their nation is not a task that can be assigned to the military alone. It is a task that belongs to every citizen.

The Army in peacetime is merely the framework around which a structure of national defense must be built. The substance of this structure comes from the manpower and industrial resources of the nation. The essence of an adequate national defense must necessarily lie in the speed with which the defense structure can be assembled in time of need.

The Chemical Warfare Association can make a vital contribution toward this end by maintaining unbroken liaison between all of the ele-

(Continued on page 62)



Maj. Gen. Amos A. Fries, Ret.
Former Chief, CWS

Former Chiefs of the Chemical Warfare Service see in Association a potent factor in National Defense by its ability to maintain liaison between Corps and chemical industry.

Maj. Gen. Walter C. Baker, Ret.
Former Chief, CWS

General Fries

CHEMICAL WARFARE, born in the midst of the first World War on foreign soil, has proven its right to a high standing among the most important military groups that comprise the defense forces of the United States, not *only* in two great wars but in the peace between them.

The three greatest achievements in World War II were the direct outgrowth of research and development of Chemical Warfare, started immediately after the close of World War I.

The one development most widely known is the 4.2 Chemical Mortar. It was in the bloody battle in the wheat fields near Soissons, France, in July, 1918, of the offensive to drive the Germans back that the first Chemical Regiment using the old 4-inch smooth bore Stokes Mortar, won undying fame and glory, but only after four days of importuning for a chance to show what they could do.

The first Gas Regiment with the Stokes Mortar firing phosphorus bombs, found the first effective way to silence German machine guns. The slaughter of American boys in front of German machine gun nests that had proven so terrible in the first four days of the battle, began immediately to diminish when the two companies of the First Gas Regiment at Soissons began firing these chemical shells.

The old Stokes was inaccurate with a tumbling shell and a maximum range of barely 1100 yards. Even then it was by far the best weapon against the German machine gun nests developed in World War I. We realized that if we could maintain all the simplicity of that Stokes and get range and accuracy, we would have a portable Mortar that should prove invaluable on the field of battle.

Immediately the Chemical Warfare became a

(Continued on page 51)

General Baker

BORN in World War I, and grown to full maturity in World War II, the Chemical Warfare Service has more than fully justified the faith and confidence of those who have labored through the years to build it up to perform its mission in war. When the history of the recent conflict is recorded, it will show that the Service was an outstanding member of all combat teams and contributed in no small measure to the successes in every theater of operations.

My congratulations go to all members of the Service,—officers, enlisted men and civilian employees. Each and every one played a most important and commendable part toward its accomplishments in combat. It has been the source of great satisfaction to me to watch the Service carry out its many and arduous missions so efficiently and to hear much praise of its work.

The operations of the Service were immeasurably strengthened by the cooperation it received from industry. Of special importance was the highly technical assistance given the Nation's skilled personnel in educational institutions and research organiations.

The objectives of the Chemical Warfare Association will serve to cement the friendships formed during both World Wars and to perpetuate the memories and traditions developed in combat—not only in a strong social spirit, but in the development of further professional knowledge and skill, so that if another war comes, the Chemical Warfare Service will again be found ready for any mission. These objectives will also serve as a means to maintain the same contacts and cooperation with industry and scientific organizations that have been so contributory to its accomplishments.

Admiral Nimitz Offers Praise For Corps and Good Wishes to Association On Behalf of Navy.

* * * * *

NAVY DEPARTMENT

OFFICE OF THE CHIEF OF NAVAL OPERATIONS

Chemical Warfare Association

Gentlemen:

During the recent conflict, the Chemical Warfare Service not only kept abreast of the needs of the service in investigating and developing new and better chemical munitions, but by its efforts fully prepared us to engage in a gas warfare should we have been forced to do so by the action of the enemy.

I feel that many of the munitions developed or improved by the Chemical Warfare Service have helped immeasurably in shortening the conflict and in saving many American lives.

I take this opportunity to wish success to your organization and its *Journal*, feeling that it will aid the Chemical Warfare Service in its future research and development, thus preserving the high standards of scientific and military achievement of the United States Services.

Sincerely,

C. W. NIMITZ
Fleet Admiral, U. S. Navy

Directors-At-Large Named For CWA

The Chemical Warfare Association was highly honored when 19 of some of the outstanding citizens of our great nation accepted appointment as Directors-at-Large.

Col. King is anticipating an early meeting of the Executive Committee, the Board of Directors and the Directors-at-Large, so that the aims and purposes of the association, as well as other important matters, may be discussed and our future course charted.

Here are your Directors-at-Large, selected by the chapters:

Dr. Ira L. Baldwin, Dean of Agricultural College, University of Wisconsin, Madison, Wis.

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CWA Comes Into Being

By CAPTAIN JOHN F. CARROLL, *Cml. Res.*

MOST important chemical compounds or associations are formed in the heat over a bunsen burner. But not so with the newly formed Chemical Warfare Association. It didn't just happen, like Topsy, but it appears to have been the result of numerous conversations over coffee cups to the effect that someone should do something about it.

Colonel Herbert K. Bear, Cml., Res.
Provisional President, CWA

The first steps towards any definite action appear to have been taken when Colonel Delancy King of the Control Section and James Hinyard came into the office of the Special Assistant to the Chief, Colonel Herbert K. Bear, in the latter part of November 1945, and suggested that someone begin to crystallize now the discussion of many years about the formation of a Chemical Warfare Association. Officers and enlisted men had frequently mentioned the Quartermaster and Ordnance Associations and asked why can't CWS likewise have one.

Colonel Bear then discussed the matter of an association with the present Chief of Chemical Warfare, Maj. Gen. Alden H. Waitt, who gave not only his approval, but his assurances of his complete cooperation and that of the Service. Thereupon a meeting was called for 3 December 1945. It was the consensus of the gathering that while the Association was open to and anxious to have officers and enlisted members of the Regular Army in its ranks, for the sake of business efficiency and permanency, it would be preferable to limit the officers of the Association to those Reserve and Emergency Officers who would shortly be returned to civilian life, where they would have more freedom of action and would not be subjected to overseas duty or the restrictions imposed for good cause by the ARs.

All those who attended the initial meeting, both the Regular and Reserve Officers were fully in accord with the formation of a CWS Association and a committee was appointed to draw up the objects of such an Association.

Ten days later, another meeting was held at which Mr. Edward Fox, Secretary of the Quartermaster Association spoke, and gave us the benefit of their many years of experience. After Mr. Fox left, a temporary organization was set up to study the other types of similar Military-Civilian organizations with a view towards avoiding the numerous dangers with which such an undertaking is fraught. It was their assignment to prepare a tentative constitution and set of by-laws.

After the Christmas holiday, 1945, an open meeting was held to which all interested and available officers and civilians of the Office of the Chief were invited. At this meeting, the tentative constitution and by-laws were approved, the aims of the Association set forth and provisional officers elected.

The aims of the Association are as follows:

1. To perpetuate the friendships, memories and traditions growing out of association with the Chemical Warfare Service.

2. To collect and disseminate useful knowledge with respect to chemical warfare and related subjects.

3. To foster a spirit of good will and cooperative endeavor among its members and with industry.

4. To sponsor new developments designed to increase the efficiency of chemical warfare means, and ,

5. To promote National Defense among patriotic citizens.

The Association will operate as a non-profit or-

ganization. A provisional Executive Committee, elected to supervise the operations of the Association until the first annual meeting, included: Colonel Herbert K. Bear, President; Colonel Clifford L. Sayre, First Vice President; Lt. Col. Joseph F. Escude', Second Vice President; Major Osmund L. Varela, Third Vice President; Lt. Col. George O. Gillingham, Fourth Vice President; Colonel Ludlow King, Fifth Vice President; Dr. William Albert Noyes, Jr., Sixth Vice President; Major William D. Kavanaugh, Seventh Vice President Captain Joseph Schwimer, Secretary-Treasurer, and Major Charles E. Pledger, Jr., General Counsel. Included among the 29 members of the provisional Board of Directors are the following: T/Sgt. C. Frederick Plitt, Colonel Donald Grothaus, Colonel Harry Spraker, Lt. Colonel A. E. D'Angelo, Major Morris Guggenheim, Major Helen Hart, Captain Robert F. Wales, Captain E. M. Smith, and First Lt. L. B. Conrath.

In the course of attending to many routine duties incident to the closing of CWS wartime facilities, Colonel Bear and Captain Schwimer, assisted in the formation of Association chapters in Boston, Chicago, Denver, Dugway, San Francisco, Dallas, Pine Bluff, Edgewood Arsenal and Washington.

While the Association is open to all active and inactive officers and enlisted men of the Chemical Warfare Service, only those in a reserve or civilian capacity are permitted to hold office. The following were elected to serve the Association during its first and formative year: President, Ludlow King, Owens-Corning Fiberglas Corp., 1031 Investment Building, Washington, D. C.; First Vice President, Arthur Crossley, Potomac Electric Power Co., Tenth and E Sts., N.W., Washington; Second Vice President (Chairman of Finance Committee) Don Rogers, Fiscal Division, Office Chief CC, Gravelly Point; Third Vice President (Chairman of Membership and Organization) Anthony D'Angelo, War Assets Administration, Room 148, Annex No. 1, 131 Indiana Ave., Washington; Fourth Vice President (Chairman of Publications) Harold B. Rodier, 4509 Ellicott St., N.W., Washington; Fifth Vice President (Chairman of Meetings) Roy Kulp, Edgewood Arsenal, Md.; Sixth Vice President (Chairman of Research and Development Projects) Ted H. Marshall, Lederle Laboratories, Pearl River, N. Y.; Seventh Vice President (Chairman of War Mobilization Planning) Clifford Sayre, 720 N. Kensington, Arlington, Va.; Secretary-Treasurer, Joseph Schwimer, 4309 28th Place, Mt. Rainier, Md.; General Counsel, Charles E. Pledger, Jr., Washington Bldg., Washington; Public Relations Director, Alex Leggin, American Chemical Society, 1155 16th St., N.W., Washington, D. C.

CWA Holds First Meeting

By JOSEPH SCHWIMER, *Capt., Cml. Res.*
Secretary-Treasurer

SPARKED by speeches from the military and industry urging closer cooperation in war mobilization planning between the armed services and the nation's mighty industrial empire, the first annual meeting of the Chemical Warfare Association at Edgewood Arsenal, May 24-25, 1946, officially plunged the association into a program of national defense that has since picked up top level support and has skyrocketed the organization into national prominence.

With Lt. Gen. J. Lawton Collins, War Department Director of Information, applauding the efficiency of all Chemical Corps units in World War II, Maj. Gen. Alden H. Waitt, Chief of Chemical Corps, followed by declaring that it was his firm conviction that future planning is a must with industry as well as within the armed services. Gen. Waitt emphasized that industry must be taken into the confidence of the War Department in all mobilization plans, and he was enthusiastically supported by Dr. Walter E. Lawson, Development Department, duPont, Inc., of Wilmington, a director-at-large of the association.

Although the rail strike prevented hundreds of members from attending, 512 persons thronged Edgewood Arsenal for the meeting. Sixteen chapters were represented.

Representatives of the 16 chapters met on the night of May 24 and threshed out important matters pertaining to the future structure of the association. The enthusiasm of these representatives is a strong indication of the association's success to date. Policy, future planning, chapter organization and the election of officers for the first association year had the representatives busy past midnight. But the work was done and today the association has taken its place as an organization that has won the respect of top industrial and War Department leaders.

Industry has responded enthusiastically to the appeal of the association. Gen. Waitt, realizing the necessary tie-in of industry to the Chemical Corps' mobilization and research and development planning, is lending his support.

The first annual meeting was a gigantic success. Local chapters are organized and new ones being formed. The association is forging ahead, cautiously but deliberately.

The spotlight is being focused on the months ahead and for the 1947 second annual meeting. Some of the speeches of the first meeting follow on subsequent pages.

CWA Objectives

Provisional President Colonel Bear, in opening address at first annual meeting, defines objectives of Association.

By COLONEL HERBERT K. BEAR, *Cml. Res.*

This is a particularly appropriate place for us to launch the Chemical Warfare Association. Edgewood, now with 29 years of military service to her credit, is our "mother" arsenal. It was here in August of 1918 that a Chemical Warfare Magazine was launched. As we all know there is no publication of this kind at the present time. In June of the following year the CWS became a permanent branch of the Regular Army and the Chemical Warfare School was established here at Edgewood. Edgewood Arsenal is the home of rich traditions of a service and it is only natural that the thousands of persons who have been associated with it through these years in a military or civilian capacity should be desirous of perpetuating their friendships and mutual interests beyond this point. Our service has inspired such great pride and spirit of comradeship that many others like me have long regretted that until now we have not had a mutual association to knit and advance our common cause. The Engineers, the Infantry, the Quartermaster, the Ordnance, the Field Artillery, and even the Cavalry have long had their separate associations. With all this in mind, a group of officers then on duty at the Office of the Chief met in December 1945 and decided that it was high time that something was done about having an association. The subject of an association was discussed and the nucleus of a Chemical Warfare Association was formed. A provisional organization, constitution, and by-laws were finally set up with the following objectives:

(1) To perpetuate the friendships, memories, and traditions growing out of association with the Chemical Warfare Service.

(2) To collect and disseminate useful knowledge with respect to chemical warfare and related subjects.

(3) To foster a spirit of good will and cooperative endeavor among its members and with industry.

(4) To sponsor new developments designed to increase the efficiency of chemical warfare means.

It is felt by the group that we did not know specifically what the future held in store and that it was necessary at this critical stage to form such an association and to participate in making a policy and shaping a permanent military organization. The rate of separation and natural reaction that developed after V-J Day jeopardized the soundness of postwar structure in many ways. It was vital from our individual point of view that we retain an active interest. We must exercise every power within our capacity to shape this postwar structure in such a war that it will meet our views of what the Army should do so that the mistakes that we made during this war can be avoided. Without attempting to single out any one field, we do know that there were many mistakes in the field of personnel, personnel procurement, classification, assignment, and in advancement. We cannot afford, by default, by lack of education, at this vital phase to permit those mistakes to be reenacted at some future time. You and I have too much at stake. The judgment, the experience, and knowledge of the 10,000 chemical warfare officers, the 3,000 or more prime contractors, the hundreds of scientific specialists, the thousands of enlisted personnel and civilians present an invaluable national asset which should be utilized in the shaping of policy.

As an association we must take advantage of every opportunity to bring forth the individual and collective efforts of every member. We must also endeavor to have intelligent cooperation with the Regular Army. A long range program must be prepared and kept alive not only for this month or this year but for many years in the future. It must be one which will interest not only you and me. It must be planned to interest those who follow us in the years to come. In shaping this program I believe the association can be of inestimable value. I believe the association provides a splendid opportunity of cementing and continuing the friendships and contacts formed during the war period.

I want to emphasize, however, that the Chemical Warfare Association is not intended to be a Reserve Officers' Association or a Veterans' Association. Those associations already exist and they have been taking care of their particular problems very well. The Association we are forming is for no particular group. It is, in effect, the creation of the first and only organization which can speak for and jointly serve the various civilian and military elements concerned with chemical warfare. We hope for and solicit the

(Continued on page 65)

CWA Is Cooperation Keystone

President Ludlow King, in his acceptance speech at the first annual meeting at Edgewood Arsenal, sets for Chemical Warfare Association the task of maintaining close cooperation between Corps and industry.

I appreciate the honor that you bestowed upon me last night and the confidence reflected by your action. In accepting the presidency of the Chemical Warfare Association, I am fully aware of the associated responsibilities and organizational work that will be required during this first formative year. That work I shall gladly and willingly contribute. However, the success of our Association will largely depend upon the assistance which we receive from you men of industry, you men of professions, you GIs and officers who will soon take your leave from our U. S. Army.

While we shall endeavor to build and maintain a healthy, cooperative relationship with the CWS and our Association, let it be thoroughly understood that in no manner will our Army direct the activities of the Chemical Warfare Association. Active Army officers are not permitted to hold policy-making positions in the Association. The reason for this is obvious. It will permit greater latitude in our activities and in no way hold the CWS responsible for same.

Some of the most important functions of our Association are to develop a close, sound relationship between industry and the CWS; to foster an exchange of ideas; to open the door of industrial laboratories to CWS and welcome industries into the development phases of CWS problems. In order for industry to most effectively produce arms, equipment and supplies for the CWS during wartime, it is highly important that a close, friendly relation exist during peacetime to permit a mutual understanding of each others' problems, achievements, improvements, etc.

We members of this new Association will not limit our endeavors to CWS. We are deeply interested in our entire U. S. Army and a strong national defense. We intend to continually support both, being fully cognizant that at the time of the next "Pearl Harbor" we must be instantly prepared to launch a vigorous defense of our homelands.

The Executive Committee and I shall plan to immediately start building the foundation of our Association. By the time we join together for our next national meeting you will be a member of a completely organized, active and hard-hitting Association. To this end my vice presidents and I firmly pledge ourselves.

Research and Development Committee

T. H. Marshall, Col., Cml. Res., Manager of Manufacturing, Lederle Laboratories, Inc., Pearl River, N. Y., Chairman of Research and Development Committee, recently named Dr. Albert W. Noyes, Jr., President-elect, American Chemical Society, Vice Chairman of the Committee, and L. T. Sutherland, Col., Cml. Res., Barrett Division, Allied Chemical & Dye Corp.; M. B. Chittick, Col., Cml. Res., Pure Oil Co., and Dr. Franklin C. McLean, University of Chicago, as members.

Col. Marshall entered the service in March 1941 with the rank of captain, and spent six months in the Industrial Engineering Division. In September 1941 he was assigned to the Technical Division and his first big assignment was as Project Engineer for the incendiary bomb plant at Edgewood Arsenal, which he designed. Promoted to Colonel, he completed his tour of duty as Deputy Commanding Officer, Technical Command, and was separated from the service last fall. He returned to his position at Lederle Laboratories, Inc., and was recently promoted to Manager of Manufacturing.

With industry finding it difficult to secure adequate numbers of scientifically trained men and engineers, Col. Marshall will soon call a meeting of his committee to try to assist industry in this serious problem. He is also ready to map out the Chemical Warfare Association's research and development program with the aid of his able committee.

The Future of Chemical Warfare

General Waitt, at the first annual meeting of the Association, outlines plans and policies projected for the Chemical Corps.

ALTHOUGH this country emerged from the war with great advances in science and technology, leadership is required in the handling of international problems and domestic industrial and political troubles. Men who were leaders in the war are those who can and must provide the type of guidance required. Former members of the armed forces and their colleagues in industry and science will do well to organize into groups according to their particular interests and experience in national defense matters.

Looking ahead, we know we must preserve our military resources. National defense, being a part of our national life, places an obligation on each in his own field. The Chemical Warfare Association is regarded as an indispensable adjunct to our chemical corps as a source of advice and other means of aid. As members of this Association you are entitled to know my plans and policies. Achievements during the war have brought to the Chemical Warfare Service a greatly improved and expanded technical organization, most if not all of which can be applied to research and development in the period ahead. New compounds discovered and developed during the war must be reckoned with. The application of atomic energy to warfare, rather than making gas obsolete, may well extend the field for atmospheric attack. Biological warfare is still in its infancy.

In the future the efforts of CWS must follow two main lines: (1) prosecution of research and development of new and better means, (2) the assurance of chemical preparedness in all aspects, which includes maintenance of stocks of standard munitions and supplies in war reserve and the continued training of the Army in chemical warwar. The research and development program is under way. Project plans have been laid out, and the recruitment of scientists and technicians for the conversion from a war to a peace basis is well advanced. Munitions and equipment required for war reserve have been determined and arrangements for long storage are in hand. Education of our officers is of great importance: we will have no need in CWS for the so-called reactionary and stand-pat military mind of the past. In any new war we will have no time for gathering ourselves and our resources, and recognition of this fact is guiding the future efforts of chemical warfare work.

The civilian world, to cooperate intelligently, must know our plans, our responsibilities and our objectives to the extent necessary to serve effectively in civilian specialties. It is intended that the scientist will be given a free hand in working out the problem. The military's job is to determine the nature of the problem. When it comes to research itself, that is a job for the civilian scientist and he must not be interfered with in his work.

CWS Research and Industry

Brig. General Charles E. Loucks, Chief of Research and Development, addresses first annual meeting.

The following summarizes the relationship of the Chemical Warfare Service's research and development program with industry and with public health and welfare in general. In addition to the primary purpose of perfecting means of waging biological and chemical warfare offensively and defensively, other benefits derive from the program. The civilian applications of various CWS developments have recently been pointed out by Secretary Patterson and General Waitt. In addition to those, it is felt that important contributions have been made by publishing technical articles in many of the scientific journals. Since the war, many more articles have been published or prepared. The Technical Division has sent over 1,400 reports to the Department of Commerce for release.

Although there is some need for improvement of munitions and methods used or contemplated during the war, it is the policy of CWS to develop means of fighting the next war, if it comes, with the most modera weapons that science can devise. This policy calls for much basic research. When research is of such general nature that many discoveries and much information having limited military significance are produced, CWS will release the facts as they become available. A considerable volume of such material is likely to

(Continued on page 51)

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War Mobilization

Report of the Committee on War Mobilization to the annual meeting at Edgewood Arsenal.

By MAJOR W. D. KAVANAUGH, *Cml. Res.*

MR. PRESIDENT, fellow members of the Chemical Warfare Association, no one who has had wartime experience in producing for and supplying a great army will minimize the importance of rapid, informed and compiete conversion of the national resources from peace to war. In retrospect we see many things that should have been done before World War II so as to lessen the shock and to increase the efficiency of the transition into war conditions. To be sure our War Department had plans—great and good plans—predicated on certain assumptions, but the circumstances never occurred in exactly the way the planners visualized them. It is with these considerations in mind that your Committee on War Mobilization approach the task of formulating a statement of policy for your review and approval. Broad in character, its nature is such that your committee believes it will produce answers to problems that merit the most thoughtful and active consideration of a patriotic body such as is this organization. Our policy must be workable; and it should be fundamental to the concept of industrial mobilization for war. We believe our proposals have these characteristics. The statement consists of four separate propositions, as follows:

First, to encourage the development of plans for the regular, comprehensive, and timely exchange of information between the Chemical Warfare Service and industry concerning wartime requirements, chemical and others, of the Chemical Warfare Service, and for the study of the ability of industry to convert for the production and delivery of the necessary quantities of the needed materials.

Boiled down this means simply the exchange of information. The War Department will continue to do the massive and dreary job of how much, when, what kind. It will be the interpretation and the study of those cold facts which must and will concern us. Let industry know what is required of it. Let the Chemical Warfare Service know what industry needs from it to accomplish the objective. Make available all such information to the appropriate executive authorities in both industry and the Chemical Warfare Service for dissemination from the highest to the lowest echelons in their respective organizations.

Second, to encourage reciprocal peacetime education and training of key military and industrial personnel so as to provide each with the other's operating routines.

This contemplates a program of training industrial personnel in chemical warfare procurement, development and supply procedures; how Chemical Warfare does things; and who is responsible for what. And vice versa, show military personnel how industry does it. Thereby, wasteful stumbling and fumbling will be minimized and we hope the transition problem will be simplified as well as accelerated.

Third, to encourage in wartime the proper utilization of personnel having scientific, technical, and other essential skills and to promote the continuity of the training of such personnel.

This committee believes that this part of the proposed policy is self-evident in its purpose. Let us act to correct an admittedly bad situation. Keep the shoemaker at his last. Misassignment and misuse of personnel seems to be an inherent and universal fault in the Army. Likewise, would it not be more economical in every respect and as a matter of policy to use existing private technical organizations, whenever possible, in time of war emergency and to assign to them a war task rather than endeavor to create new technical organizations?

Fourth, to encourage the integration of all military chemical requirements in time of war and to improve and simplify such governmental controls as are necessary.

Greater use of economic controls than ever before was exercised by our government during the last war. The producers and suppliers were required to use an inestimable number of man hours in compiling statistics and filing a seemingly endless number of reports. Many duplications, caused principally by the overlapping of agency responsibilities, resulted in great hardships and costly delays. Let us, therefore, learn by our mistakes and study ways and means to efficient and minimum control.

In the chemical field the situation was particularly bad and the estimates of requirements often were subject to wide and daily fluctuation. In part this was due to lack of control in the Army of its chemical needs. The chemical requirements of Chemical Warfare Service, Ordnance, Quartermaster Corps, etc., often needlessly interfered

(Continued on page 49)

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Emergency Preparedness

Industry considers the capacity of our Association to be of assistance to the Regular Army.

By W. E. FERRIS

An address delivered at the first annual meeting at Edgewood Arsenal.

THE first real job which confronts the Association is to secure the cooperation of industry. Patriotic motives are not strong enough in peacetime to hold the interest of industry nor is the incentive of good fellowship sufficient to stimulate continued interest in a long-range preparedness program which must be kept alive not only for this month or this year but for twenty or thirty years hence, a never-ending program. It must be one which will interest not only you and me; it must be planned to interest those who follow us in the years to come.

Preparedness is the Regular Army's paying job. It is their one and only job during peacetime. The members of the Association, to be of assistance, would have to contribute their efforts on the same basis that a scientist contributes his efforts to research—for the honor or for the pure love of the job. However, we should not kid ourselves for one minute that we, collectively—as members of an Association, will cooperate with the Regular Army preparedness program "for the love of the job."

As an Association, we must exploit every motive that will bring forth the individual and collective efforts of every Association member, and the Regular Army must be made to realize what it takes to stimulate the pattern of human behavior to bring forth intelligent cooperation over a long-range program.

What are these motives that will make the job attractive to individual members? A list of some of them looks like this: patriotism, honor, publicity, good fellowship, and the desire to know what is going on. I believe that as an association we should make use of every possible motive—except one, that one is monetary gain. Of course every one of us has his price, but I don't mean that $ sign when I say price. We can all be rewarded, or at least stimulated, by satisfying some other motive than the pursuit of the elusive dollar.

If in the formulation of a plan the Association will seriously consider what it takes to secure the continued interest of the individual, we will have a long-range plan that will endure. Above all the Regular Army must be sold on the plan, and both Army and Association must do everything possible to obtain individual and collective cooperation between Army and industry.

The industrialist could assist the program in many ways. He could sit in on the design of materiel. He should influence the design so that the item would lend itself to emergency production. Anything that will help to secure immediate production will be valuable. A bomb today is worth fifty bombs six months from now.

The industrialist knows what materials are currently available: what shapes, sizes, and other such qualities. For emergency production he would like to use the tools he has, also the materials immediately available. He would insist on the use of standard nuts, bolts and thread sizes. Current manufacturing methods should influence design. He could also assist in getting together drawings and specifications which should result in a meeting of minds as to what is a workable or acceptable product. The Army could assist this program by making the efforts of industry welcome, by making industry feel that they are an indispensable part of the program, by making full use of industry's efforts, and by giving publicity to industry whenever they have earned it. This would stimulate cooperation on the part of industry.

The Army and industry always have had differences of opinion as to design, procurement and production procedure for Army materiel. The interchange of information on such subjects should create harmony between industry and the Army. Industry often cannot see why the Army must follow certain methods and procedure. Industry has always followed the method of producing an item and "selling" it to the customer. They tell the customer what he should have. The Army tells industry what *they* want, and frequently this irritates the industrialist. He wants to know the reason why.

W. E. Ferris is Vice-President of the Day and Night Manufacturing Company, Monrovia, California. The Day and Night Manufacturing Company was one of the loaders of M-50 and M-69 incendiary bombs for CWS during the war. Mr. Ferris is a leading industrialist on the West Coast and his article should be of much interest to everyone.

Cooperation can be obtained by making industry realize the conditions under which Army materiel will be used: the climate, dust, dirt, moisture, safety requirements and the intelligence of the prospective user. Industry should be told why specifications are written to incorporate items which seem to the industrialist to be unreasonable; why such close tolerances are necessary; why certain materials are necessary, and why certain procurement regulations are necessary. Though much of this has been done, and the industrialist of today is acquainted with present Army procedure, the industrialist of tomorrow will be in the same position as the industrialist was before Pearl Harbor, unless this kind of work is carried on. The work of the Association is this direction will prove valuable in emergency preparedness.

To stimulate industry's interest continually, small orders for Army materiel could be placed from time to time with reputable manufacturers on a no profit basis, and they could be sold on this no profit basis. Other motives should reward them sufficiently to overcome the profit item—patriotism, publicity, etc. By this method, production "bugs" could be rolled out before the emergency existed. This also has been done, but it should be continued, at least in a small way. It is the best way to keep industry acquainted with Army procedure.

The prewar plan of making surveys of manufacturing plants was a step in the right direction, and it should be continued in some manner. Industry could be quite helpful in assisting the Army to keep their records up to date. From these records the Army would at all times have a good estimate of production possibilities to meet an emergency.

The greatest emergency preparedness problem the Association will have to handle is to make both industry and the Regular Army realize that cooperation is absolutely essential. At this time the problem is not great, because we are still war conscious. In a few years hence, we ourselves will be replaced by others who were not touched by the recent war. At that time the Army will have no use for industry and industry will be irritated if called upon for assistance by the Army. It really means a long-range, well-planned educational program for both the Army and industry, and it is the Association's work to initiate this educational program.

The pattern of this educational program should be to educate those who will head our Army 20 to 30 years from now, those who will guide our industry in years hence. Since time began, industry has played a greater and greater part in winning wars. In World War II, when our industry began to out-produce our enemies, we knew we would win the war. In our effort to win the war, our main objective was to destroy the enemies' production facilities. The time has passed when wars are won by fighting man-forces alone. The Association's educational program should start with the young men who will head our Army and Navy in years to come, and the young men who will head industry at that time. Both should be made to realize their responsibility for preparedness in an emergency and the part they would have to play. They should be taught that neither the Armed Forces nor industry can win a war alone; that the utmost cooperation in peacetime is essential to bring about victory in war. This should be part of the early education in the lives of leaders of tomorrow.

Industry should realize that the Army cannot win wars without its help; and the Army should be taught in our military academies the importance of cooperation with industry during peace time. Industry should be taught in our colleges, its peacetime responsibility and its essential part during a war. Industry must be trained to play a larger part in each succeeding war. With this education, emergency preparedness will take care of itself. It is the long-range program we must have. Industry will never be in a position to plan how a war will be fought, nor will the Army ever be able to plan production without the help of industry. Close cooperation between the two must be brought about . . . neither can stand alone in time of war. They must cooperate during peace time.

JOHN D. RUE JOINS HOOKER COMPANY

The Hooker Electrochemical Company has appointed John D. Rue as Works Manager of its Tacoma plant.

Mr. Rue, a widely known authority on the use of chemicals in the manufacture and bleaching of pulp and paper, has been associated with the Hooker Company since 1931. Prior to that time he was in charge of the pulp and paper section of the U. S. Forest Products Laboratory at Madison, Wis. At the Hooker Niagara Falls plant, Mr. Rue was engaged in sales service, particularly for the pulp and paper industry. Since 1942 he has been associated with the engineering department as executive assistant to the chief engineer.

Mr. Rue brings to the Tacoma plant and the West Coast an intimate knowledge of both chemicals and engineering involved in the pulp and paper industry, as well as a broad experience in technical and chemical engineering service.

Why Prepare?

By W. W. FINLAY

An address delivered at the first annual meeting at Edgewood Arsenal.

HAD the United States been prepared for war in 1939, there would not have been a war. For the past six years, this statement has been made in varying forms by many people in authority, and as the weighing of experience tends to crystalize our thinking, we come more and more to regard it as a self-evident truth.

Obviously, Germany and Japan did not engage in a war of aggression thinking they were going to be the losers. They started the fracas quite certain they were going to win. This certainty was based upon an evaluation of their own strength and the potential enemy's weakness. To both Germany and Japan this country was a potential enemy, and therefore our ability to wage war was an important item in their calculations. In other words, our weakness was a major factor in their decision to start a war of conquest.

To catalogue our own unpreparedness would be far too lengthy for this occasion and not necessary for our purpose. Perhaps the word "unpreparedness" is too harsh in its implication, and the term "insufficiency" a better one. Much of what had been done by the United States in the years between the First World War and the opening of World War II in the field of military and industrial preparation, was good. Such funds as were made available were well spent on the development of war material. War plans for industry were formulated and, within the limitations of resources and interest, kept up to date. The Ordnance Association did a good job of establishing a close liaison between the Ordnance Department and manufacturers. But the insufficiency of all this is proven by the fact that, when war was brewing in the Orient and Europe, our overall military weakness was so obvious to the rest of the world that we did not count as a serious deterrent to those powers who were fast driving towards a cataclysmic war.

True, when we found ourselves in the position of having to take sides, with inevitable entry into the conflict, our military and industrial machines moved into high gear with a rapidity that is still amazing. This took time, a much shorter time than even we, accustomed as we were to American production miracles, thought possible. Certainly our enemies were confounded by the speed with which we turned our industrial capacity to such dizzy heights. In fact, it was this miscalculation on their part that proved to be the mistake that ruined the whole plan. Nevertheless, this all took time—months to do the work of years, two years to reach the normal accomplishment of a decade —but time, nerve-wracking, precious time.

It is of the utmost importance that this factor of time be remembered constantly, because never again will there be any time available. In the light of our experience of the past seven years it is a safe assumption that for the last time in history this country was given an opportunity to adequately defend itself after war became inevitable.

Preparedness, without a strong, highly trained and technologically up-to-the-minute military organization, is not possible, but the key to the whole structure of adequate preparation is the industrial machine. In American industry there is an enormous reservoir of brains and driving energy, capable of opening up vistas through its scientific research and of devising from this knowledge any weapon of defense or offense that our military tacticians dictate. Equally important, our industrial resources include the ability and courage to think and act in terms of mass production, conservation of manpower and high speed action.

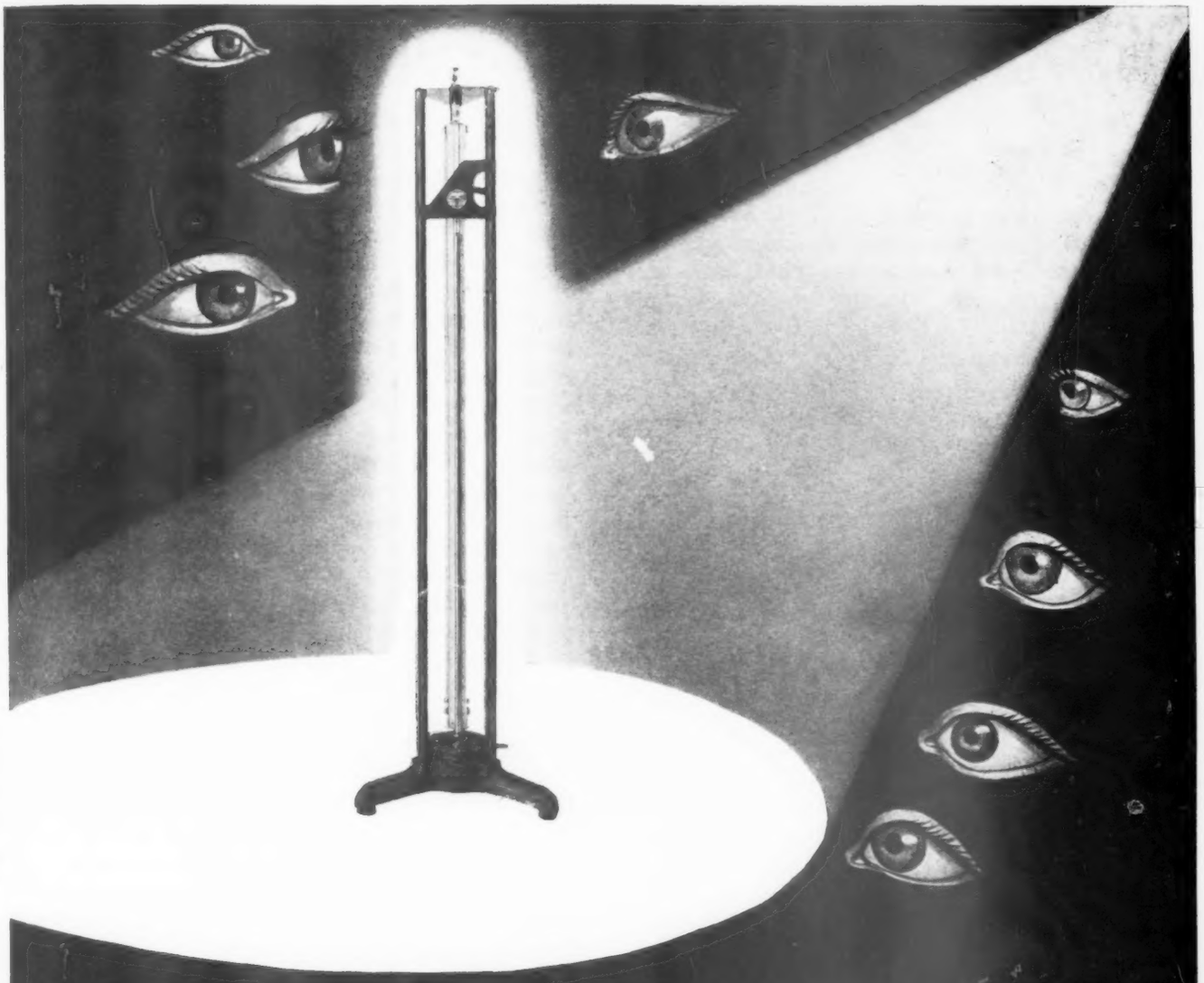
The immediate problem is to establish a closely meshed, dynamic relationship between our military and our industries, in order that full advantage be taken of the huge industrial power that this country possesses.

To accomplish this successfully will require the expenditures of large sums of money from the public treasury, and the usage of those funds in a highly efficient manner. In this regard, we must bear in mind that we are not investing this money in research, capital equipment, special tools, etc., for the same purpose as would private enterprise. This outlay is an insurance premium against war.

Private industry must keep our military people up-to-date as to the results of its research, and

(Continued on page 63)

W. W. Finlay is President of The Guiberson Manufacturing Company, Dallas, Texas. His company was one of the largest producers of the famous 4.2 Chemical Mortar shells. The article written for the Journal by Mr. Finlay is a clear-cut indication of what industry wants to do in the promotion of our National Defense program.



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Biological Warfare—Facts and Thoughts

By A. E. HAYWARD
Associate Editor, The Journal

THE war which ended just a little over a year ago introduced many new ideas and concepts, and emphasized many others which were only incompletely realized. Not the least among these was the dramatic part played by scientific and technological forces in developing new and tremendously effective weapons. Sufficient testimony to this is to be had in the atomic bomb, radar, rocket bombs, proximity fuses, and countless other such innovations.

These triumphs in the field of physical sciences were paralleled by advances in the biological field. The development of antibiotics, the new toxoids and vaccines, the marvel of blood plasma; these are all stories which have been told. The history of biological warfare, however, has necessarily remained shrouded in secrecy, and is perhaps regarded as mysterious and nightmarish. There is little reason for this attitude: biological warfare is no more new or novel than catching cold from a neighboring sufferer on the street-car; and it does not seem as horrible, certainly not as painful, as being burned to a crisp by incendiary weapons or eviscerated by a bayonet. Actually, biological warfare is nothing more or less than an exploitation of natural disease processes to which man has been subjected since time immemorial, and to which the majority of us will succumb in the normal course of events anyway.

Defined more formally, in the report of Mr. George Merck to the Secretary of War, biological warfare is "the use of bacteria, fungi, viruses, rickettsiae and toxic agents from living organisms to produce death or disease in men, animals, or plants." So defined, it is not hard to find instances of its use, and one need only recall the ancient practice of poisoning wells with the bloated carcasses of animals and the use of poisoned arrows by certain jungle tribes.

However, it was not until the researches of Pasteur, Koch and other great bacteriologists placed the study of communicable disease on a firm scientific basis that the directed use of the microbes causing these diseases became possible. The concept must have been realized, at least partially, toward the end of the last century by the great French scientist, Louis Pasteur, when he proposed that certain bacteria called salmonella be used to cause epidemics in wild rodents and thus exterminate them.

These advances had been made and sufficient technical knowledge was available by the time of World War I to permit the use of bacteria as a limited weapon of sabotage. There is documented evidence that the Germans did make use of this form of warfare; Rumanian cavalry horses were infected with glanders and a spy was caught attempting to carry out the same mission in the French cavalry. There is also incontrovertible evidence that German agents, working in the United States in 1915, used disease-producing bacteria to infect horses and cattle prior to shipment to Europe. This is probably the first instance in which a pure bacterial culture capable of causing a known disease was used against an enemy.

Whether because of reports of this use of bacteria, or because of a vivid imagination, the possibility of spreading disease throughout a warring nation caught the fancy of the writers of pseudo-science fiction. The paper-pulp thrillers, Sunday supplements and "comic" strips of the period of 1920-1940 made frequent mention of this type of attack, at the same time dwelling on rocket propulsion as a means of developing the super-airplane and depicting the might of atomic power. During this same period some attention was paid to bacteriological warfare by more serious and technically trained writers.

Thus we find that "bacteriological warfare" was discussed by the Conference on the Limitation of Armaments which met in Washington in 1922, and further notice taken of the subject by the General Committee of the Disarmament Conference under the auspices of the League of Nations at Geneva in 1932. At this time "bacteriological warfare" was grouped with chemical and incendiary warfare and was prohibited for use by nations in time of war.

Perhaps under the stimulus provided by this discussion, a number of critical and intelligent papers appeared in the technical periodicals. The general tenor of these reviews, which appeared in the United States, England, France, Italy and other countries, was that biological warfare was possible, but that immense technological improvements were necessary before it could become an actuality. A number of the writers went so far as to say that the obstacles were insurmountable.

However, on one phase of the question all of the writers came to unanimous agreement—that the devastation theoretically present in a caused epidemic, if such could be attained, was incalculable. The yardstick by which we might estimate the possible damage arising from the intro-

(Continued on page 50)

Men and Women of CWS

By JOHN KAISER, *Master Sergeant, CWS*

MEN OF THE Chemical Warfare Service fought on every battlefront of World War II. On the burning sands of Africa, along the wind-swept beaches of Sicily and over tortuous mountain paths of Italy, in the steaming, stinking island jungles of the Pacific, in India and over the towering peaks of the Himalayas, in Burma, in China, on the beach at Normandy, across the plains of France and beyond the Rhine into Germany, the chemical warfare soldiers blazed a trail of glory. Their blood has drenched the battlefields of many lands. Their weapons, many and varied in use, wrote a new page in history's books. Their chemical mortars tore enemy strong points to pieces and screened advancing troops. Their mechanical smoke generators screened cities from enemy fire and blanketed rivers enabling armies to cross unseen by the enemy. Their fire bombs sent terror into German hearts and burned Japanese cities. Their flame-throwers turned enemy strong points and pill-boxes into fiery furnaces of death.

Men of the Chemical Warfare Service, far behind the lines, gave day and night effort to the training of chemical troops; their schools of instruction functioning unceasingly. They lived in factories, arsenals, and laboratories; and made, and loaded, and shipped across the seas a mighty stream of chemical supplies—kept it a steady flow, like a giant flood of waters breaking its dam—for the men manning the weapons which did their bit in bringing final victory.

And last, but not least by any means, women of the Chemical Warfare Service worked as unceasingly, as untiredly, and with equal heart and soul as their brothers. They clerked and typed, kept records, handled the mail, and directed personnel. They served overseas, and they worked in arsenals and industrial plants on chemical supplies. They handled, and packed, and shipped the deadly chemical munitions that through their care and efficiency reached the battlefronts of the world. In plant accidents and amid the whirl and roar of machines their blood was also contributed to the cause, and not in small quantity.

Such a record of service should not die. It must live, and can do so only through those whom the world struggle did not devour. The history of this band of pioneers, of these fighters and workers, of the efforts and deeds of the men and women who filled the ranks and tramped the weary but glorious road of accomplishment, has yet to be written. It can only be written by the living soldiers and workers of this band. Whether or not they are members of the Chemical Warfare Association they can send in an account of their experiences, a tale of battle, of individual heroism, of service rewarded or unrewarded, of humor or pathos, of long hours of labor, accomplishment of the seeming impossible, accidents, research, discoveries, of life and death; and the national magazine of the Association will publish them. It is these stories and narrations that will give the World War II history of the Chemical Warfare Service a heart throb and a soul far different than the dry and lifeless pages that usually evolve as the record of wartime military organizations. Thus written, this history will not be a story told by a great writer, but an epic related by hundreds of thousands of men and women who stood the test and were not found wanting.

Maj. Edmund H. Schwanke, Secretary-Treasurer of the Edgewood Arsenal Chapter of the Chemical Warfare Association, presents Master Sergeant John Kaiser, member of the First Gas and Flame Unit and veteran of the Spanish-American War, with his Charter Membership Card in the CW Association.

For my swan song, ending a military career extending over a period of 49 years with service in the CWS from birth to now, I urge those men and women with whom I served the long, oftimes hard, years, and for whom I have such high regard—the love a soldier bears another who has faced death with him—to give during the time of peace all that is within their power to keep their service alive. I know of no agency whereby or through which this can be done, except the Chemical Warfare Association, which is your Association, and will be as strong and as efficient as you choose to make it.

Revitalized Procurement Planning

By COLONEL PATRICK F. POWERS, *CC*
Formerly Chief, Procurement Division

IN the years between World Wars I and II, procurement planning for CWS as well as other Services was something of a hit-and-miss affair. A stab was made at lining up production facilities to meet national emergency requirements, but this set-up existed more on paper than

Colonel Patrick F. Powers, CC
Former Chief, Procurement Division

in actual practice. Some so-called "educational orders" were placed, yet most private sources of supply were not committed to nor prepared for military production when war came.

As a result, there was plenty of confusion and headache. Makers of articles for commercial use faced countless problems in converting to the new and different items required for battle. There was unnecessary delay and error in changing over. One particularly sad feature was a lack of exchange of ideas so that war plants could profit from the experience of others.

Considerable manpower was wasted. Records and safety methods were at variance. There was no standard plant design or operation. Performance of the same job varied at different plants. For example, two concerns made a particular incendiary mixture by different processes. In order to turn out wares foreign to normal production, there was much improvising and use of assorted tools. Also, techniques differed and many were uneconomic.

Early this year CWS promulgated a new procurement planning policy. The latter is prefaced with a definition of procurement planning as "the continuous collection, evaluation, and recording of data basic to effective, efficient, economical and dependable procurement of specified items, in designated quantities and in accordance with definite schedules."

The broad general steps required for such accomplishment, on the basis of known requirements, are set forth in the following sequence:

1. Selection of suitable areas for the location of production facilities.
2. Location of production facilities with respect to raw material requirements.
3. Evaluation of production facilities requirements.
4. Selection of suitable contractors.
5. Evaluation of selected contractors.
6. Placement of procurement planning schedule.
7. Continuing review to insure that, in the light of changing conditions and practices, the contractor continues the most suitable and satisfactory manufacturing method.
8. Continuing review by CWS of new production equipment and methods to insure that these advantages will be incorporated in procurement planning.

Selection of production areas involves location of a facility to best serve a coastal port, establishment of facilities in central areas for security reasons, opening of untapped labor areas, and other factors.

Economic or other important considerations may dictate locating a plant near a source of bulky or critical raw material important to the end product.

Evaluation of facilities requirements is the heart of effective planning. It should be based upon every factor entering into production. Therefore, CWS would offer advice and assistance in such things as:

Plant layout and space requirements
Operation sheets
Flow or process charts
Operating and safety directives
Special operating techniques
Equipment data and specifications
Tool, jig and fixture drawings
Personnel requirements by skills
Power, water, transportation and other utilities
Approximate cost of product

Selection of contractors is premised on their ability to meet established quality and quantity production, plus

Reliability and dependability
Financial stability
Labor availability
Present efficiency of plant operation
Present staff of key engineering personnel
Extent of conversion required
Probable cost of product to Government

Closely linked with this step is comparative evaluation of selected contractors to determine those most suitable for certain products and dealings with subcontractors and suppliers.

Following such determination, a production planning schedule is placed upon the most suitable contractor or contractors, thoroughly familiarizing the contractor with his function and securing his acceptance to the schedule.

Once these schedules are put into operation, continuing review is essential to see that they are lived up to. This involves consideration of any changes in the status of the contractor or his production equipment and operating methods.

To follow out this broad outline, a general sequence of procedures is charted. First, the Chief of the Procurement Division receives procurement planning requirements and reviews them. Schedules are then referred to an appropriate planning installation which, after review from the regional angle, selects contractors, places schedules, and supervises production. All related papers and reports are furnished the Office of the Chief so that a comprehensive picture of program status is available at all times.

The CWS procurement policy points out the following basic considerations:

"The evaluation of production facilities requirements, while an individual matter for each item, is also applicable across many programs. A new production technique discovered in connection with one item of materiel may be used to great advantage in connection with other items. A new operation involving a particular type of production equipment cuts across item lines and may affect programs in all installations.

"Basically, the evaluation of production facilities requirements is by way of being a cooperative job, being made by one installation but summarizing the knowledge and experiences and review of all installations, the OCCWS and private industrial sources.

"While cooperation cannot practicably be carried to the point where all installations survey every item, it is considered both desirable and essential that technical data available any place in the CWS be made available to all installations. Accordingly, each installation should maintain complete planning data, including the following for each CWS item, whether scheduled on that installation or not:

"a. Drawings, specifications and change orders.

"b. General information pertinent to the planning program.

"c. It is considered desirable that all installations be furnished copies of reports covering evaluations of production facilities requirements and subsequent changes thereto. It is not considered that the physical distribution is feasible at the present time. However, the OCCWS will make distribution of these data insofar as is practicable. In the event any installation is interested in a survey report and has not received a copy thereof, such copy will be made available to the installation promptly upon request therefor to OCCWS.

"Additionally, in connection particularly with continuing review of production facilities, there should be frequent interchange of ideas among the personnel of the various installations and OCCWS . . . Effort should be made for the establishment by contractors of CWS liaison personnel qualified in production engineering. Association should be maintained with the CWS Advisory Board, industry organizations, technical societies, trade publications, etc. Experimental operations should be undertaken to prove or disprove possible improvement in production methods."

The goal of CWS procurement planning is to insure the turning out of required military materiel with a minimum of the delay, cost and disruption that ushered in World War II. It is not enough that a private contractor be listed as willing to do something—CWS must have definite knowledge that he can, and how he will, do the job. Further, the CWS must be prepared to counsel and assist him in his war work.

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Research for Military Purposes

An address prepared for delivery at the first annual meeting at Edgewood Arsenal and read by Colonel T. H. Marshall on behalf of Dr. Noyes, who was unable to be present.

By DR. W. A. NOYES, JR.
President-Elect, American Chemical Society

Dr. W. Albert Noyes, Jr.
President-elect, American Chemical Society

NOW that the war is over, many of us are returning to peacetime pursuits, but we should not forget, as too many of us did after the last war, that international crises occur periodically and that that this country must maintain itself in a position to exert an influence in world affairs. That such an influence will be small indeed unless we are powerful goes without saying.

All of us without exception should do everything in our power to further international collaboration and avoid international strife. For this reason I am visiting London and am forced to forego the very real pleasure of being with you personally. In doing our bit to further the success of the United Nations, we must not adopt the attitude of extreme pacifism which prevailed in so many circles between the two wars. We must learn to give as well as to take, but we must not be weak.

Now is the moment to review our war effort and to examine ourselves critically. In doing this, we must be very humble indeed. The democracies of continental Europe succumbed rapidly to enemy attack. The only ones which survived the early days were not attacked, or were separated from the Axis powers by a water barrier. The English channel undoubtedly saved the United Kingdom, and the Atlantic Ocean gave this country more than two years of leisure in which to prepare. The Axis nations were inferior in natural resources, in manpower, and in technical ability. It was obvious that unless the Axis could win rapidly, the full mobilization of the resources of Russia, the British Empire, and the United States would spell its ultimate defeat. Hence victory on our side was almost inevitable once we survive the initial shock, and such survival depended in no small measure on water barriers. These will be less important next time.

During the recent conflict, research on items of war was carried out by Army and Navy laboratories, by Army and Navy contracts with research institutions and industry, and by the Office of Scientific Research and Development. The latter organization was officially started in August, 1941, but contained the National Defense Research Committee which was formally established by an order signed by President Roosevelt, on June 27, 1940.

At the start of the war in Europe this country was emerging from several years of depression during which Government budgets had been drastically reduced. The staffs of Government laboratories were small, the equipment was meager, and there had been insufficient money to prosecute research actively. This unfortunate situation made mandatory a rapid expansion of research on items and instruments of war.

It is not the purpose of this talk to list either the accomplishments of the OSRD or of Service Organizations, but rather to ascertain whether they worked effectively in a coordinated program.

The NDRC chose to use, whenever possible, existing research facilities in academic institutions, research institutes, and industry. Only in this way could a large scale program be started

rapidly. In June 1940 a feeling of urgency did not exist, although the scientists of the country responded eagerly when requested to serve. Since professors could easily drop peacetime research and devote the time thus freed to war research, it was inevitable that most of the early key positions should be filled by academic men. Many of these had never worked in large organizations, and very few had had any military experience. It is not surprising that much time was wasted in getting started.

The attitude of the Army and Navy toward the new organization was very mixed, but on the whole, there was a natural skepticism as to the usefulness of a bunch of scientists. Moreover, pride of organization led to some jealousy and suspicion, and there was sometimes a conscious attempt to refer to NDRC only long range programs which did not conflict with work being carried on by the Services themselves. This led to a feeling of frustration which was only gradually overcome as the scientists became more intimately acquainted with the needs of the Army and the Navy.

There were two major reasons for the lack of effectiveness of the NDRC during the first years of its existence. Its personnel did not know which problems were important. Indeed, the Army and Navy themselves were encountering new problems which they had not foreseen and were often unable to state military requirements with any precision. It might have been possible to provide better means of ascertaining the important problems both on the part of Armed Service technical organizations and of the OSRD. The second reason lies in the fact that Army and Navy officers tried to give orders to OSRD. Few of these are competent to direct scientific research.

In some areas the situation became particularly acute, and a feeling of open rivalry and hostility existed between civilian and military organizations to the point that one often wondered what type of war was being waged.

Several obvious lessons can be learned from the situation which existed early in the war. In the first place it is evident that military requirements for many items needed in a modern war cannot be specified by the Armed Services without the aid of scientists. Indeed, for many items the final word must reside with scientists and not with Army and Navy officers. How could Army and Navy officers ever have established military requirements for an atomic bomb? How could they ever have drawn proper specifications for a screening smoke generator? The highest type of scientific knowledge is required for this type of work, and frequently the scientist is in a better position to know whether some new idea or gadget would be useful in combat than is a professional soldier.

The attempt to direct NDRG from above on the part of the Army and Navy might have had disastrous consequences. It might be pointed out that there never would have been an ESSO smoke generator or any other type of mechanical smoke generator if the NDRC had chosen to obey a letter from the Chemical Warfare Service. An attempt to separate the study of soda lime from the study of the rest of filling of the gas mask canister would have led to retention in the gas mask canister of material which is inert to the majority of war gases. Fortunately Dr. Bush and Dr. Conant took the attitude that scientists should work on things which they considered important even if the work seemed not to be fully appreciated by the military.

Probably the greatest lack during the early days of NDRC was an intimate contact between laboratory workers and persons in the Armed Services. Such contacts as there were existed at high echelons by individuals on both sides who did not know the full score. By the end of the war interchange of personnel between OSRD and Service Organizations was taking place on a large scale, and much of the early friction and misunderstanding had disappeared.

It was evident to those associated with Technical Division, CWS, that a large void existed which could only be filled by officers and men who had been in combat. How can a man in a laboratory fully appreciate the strain of combat and its effect on the ability of a soldier to operate a complicated mechanism? Or how can he fully appreciate what it means to add even a few pounds to the equipment a soldier carries? Even within the Army itself technical groups were not given adequate access to information derived from combat experience, and the situation was even more acute in the OSRD. Toward the end of the war some progress had been made. Representatives of Technical Division did visit the various Theaters and OSRD representatives were overseas by the hundreds and thousands.

At this point we should mention that the early contacts of the OSRD with the British did much to educate personnel on military requirements. My own education in chemical warfare really began with a visit to England six months before Pearl Harbor. The British were next door to the war and British scientists had been thinking about military problems for several years.

We might examine for a moment the system used in the United Kingdom. Much of the research on items of war was centralized in the Ministry of Supply, a civilian organization. The Ministry of Supply not only had control over

governmental stations, such as the one at Porton, but was responsible through extra-mural contracts for research in scientific institutions. Nevertheless there was friction in the United Kingdom, and work in the universities was not always favorably received by established organization. It is difficult to say whether friction in the United Kingdom was less than in the United States or not, but on the whole centralization of direction simplified the organization and made for better contacts than existed in this country.

Army and Navy officers are not technical men. There are only twenty-four hours in the day, and a man who is a good officer cannot be expected to be a competent scientist in a day and age when scientists themselves must specialize to be effective. It is not too much to expect, however, a tolerance and appreciation of science by Army and Navy officers. The latter must be willing and able to use scientists in the proper way. It is trite to say that choice of key personnel for those positions relating to adoption and use of new items must take account of these facts.

Another lesson is, perhaps, obvious. Never again should we enter a war without having a large group of scientists thoroughly familiar with military procedure and military problems. The best remedy for hard feelings is personal contact, and some mechanism must be devised for ensuring that Regular Army and Navy officers are acquainted with and friends of many scientists.

At the start of another conflict scientists must be sent to the front immediately so that they can ascertain important problems at first hand. Those sent must, of course, be carefully chosen. They must have personalities which will ensure cooperation, and moreover, they must have a flair for the practical.

Still another point, learned in World War I, and forgotten too much in World War II, is that some research work must be carried on in the Theaters. Information concerning the use of items and for the development of doctrine is often best obtained where the problems arise. The Far Eastern Technical Unit was an excellent example of something which should have been started much sooner. Such a unit may not have been necessary in the European Theater of Operations since the British had scientific laboratories close at hand, but the situation was vastly different in the Pacific. Theater requests were too often ignored by armchair officers in this country.

It is difficult to state, in retrospect, whether the OSRD should have been started at all, but unless the system in the Armed Services could have been changed, it was probably essential to have such a civilian organization. Army technical organizations were headed by Regular Army officers who were shifted from position to position every few years. They could not be expected to attain a high degree of technical competence.

The following recommendations are made as a basis for discussion:

(1) Army and Navy technical organizations should be headed by civilians who are not obligated to follow orders from the Military, and salaries should be high enough to ensure that high positions are filled by competent men.

(2) All scientists should be kept out of uniform so that those who are incompetent can be displaced and so that no stigma is attached to those who are not in the Army or Navy. This would avoid much hard feeling. Special provision would have to be made for those who go into combat zones. This was done during the last years of the recent conflict.

(3) Much development work on offensive and defensive materiel must be necessarily carried out by the Armed Services themselves, but the long range research should be done by contracts with research institutions and with industry. A large number of such contracts would provide the best basis for keeping the scientists of the country acquainted with Army and Navy problems.

(4) More advisory panels and boards for the Armed Services should be organized if for no other reason than that friendships are cemented by personal contact and by having drinks together occasionally. Such panels and boards may seem to be ineffective, but they would serve the very useful purpose of permitting a good judgment to be made as to which officers and civilians should be put in important positions during a crisis.

These recommendations are designed to avoid competing and semi-hostile organizations and to ensure that the scientists of the country can play their part in national defense with much less delay than was encountered in 1940-41.

Finally I should state that my own relationships with the Chemical Warfare Service were happy ones. I never felt that I was an outsider. The officers in the service were appreciative of the work performed by the OSRD. Probably in no other area did civilians and military get along so well together and have such a unified program. The statements above merely reflect a strong feeling on my part that the mistakes of the recent conflict should not be repeated and that the system must be improved if we are to embark on a war without the long period for preparation which we were fortunate enough to have this time.

Group Members Back CWA Program

During the initial stages of the organization, considerable discussion was undertaken by the provisional board of directors as to whether the Chemical Warfare Association would be broad enough in scope as to include many of the industrial and engineering firms with whom the service had contact during World War II.

It was unanimously decided that inasmuch as two of the most important tasks of the association were research and development and war mobilization planning, the association could not accomplish its mission without the benefit of the knowledge and wisdom of industry. Therefore, the group membership plan was decided upon and the Secretary was requested to contact as many of the outstanding firms as he possibly could.

The Secretary contacted more than 200 firms, all of whom were directly or indirectly concerned with the production of Chemical Warfare Service materiel. Of that number, 52 joined as group members.

Within a very short time, the matter of procurement planning will become one of the most important phases of chapter meetings. Naturally, all our company members will be kept informed as to the plans of the Chemical Corps as far as military security will permit. However, industry is essential to procurement planning and the association feels that its group members who are interested enough in our progress should engage in the formation of procurement planning policy of the association as it pertains to the Chemical Corps.

In addition, research and development must be drummed up within the War Department. This cannot lag if our nation is to be prepared. Every possible assistance will be given by the Chief, Chemical Corps.

The list of group members as of 15 September 1946 include:

Agawam Dye Works, Inc., Lawrence, Mass.

American Cyanamid Co., 30 Rockefeller Plaza, New York.

The Barneby-Cheney Engineering Co., Columbus, Ohio.

The Bell Machine Co., Oshkosh, Wis.

Buffalo Electro-Chemical Co., Inc., Buffalo, N. Y.

Celanese Corp. of America, New York City.

Chicago Eye Shield Co., Chicago, Ill.

Day and Night Manufacturing Co., Monrovia, Calif.

Doehler-Jarvis Corp., New York City.

Dow Chemical Co., Midland, Mich.

Dryden Rubber Co., Chicago, Ill.

E. I. duPont deNemours & Co., Inc., Wilmington, Del.

Electromaster, Inc., Detroit, Mich.

Empire Stove Co., Belleville, Ill.

Federal Laboratories, Pittsburgh, Pa.

Fencil, Wm., Co., Huntley, Ill.

Firestone Rubber & Latex Products Co., Fall River, Mass.

Firestone Tire & Rubber Co., Akron, Ohio.

Fraser & Johnson Co., San Francisco, Calif.

General Dyestuff Corp., New York City.

General Tire & Rubber Co., Wabash, Ind.

Handy & Harman, New York City.

Heil Co., Milwaukee, Wis.

Hercules Powder Co., Wilmington, Del.

Heyden Chemical Corp., New York City.

Hub Hosiery Mills, Lowell, Mass.

Hooker Electrochemical Co., Niagara Falls, N. Y.

Industrial Rubber Goods Co., St. Joseph, Mich.

Lambert Pharmacal Co., St. Louis, Mo.

Merck & Company, Rahway, N. J.

Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.

Monsanto Chemical Co., St. Louis, Mo.

National Fireworks, Inc., West Hanover, Mass.

National Magnesium Corp. of Md., New York City.

Niagara Alkali Co., New York City.

Pemco Corp., Baltimore, Md.

Pennsylvania Salt Mfg. Co., Philadelphia, Pa.

Pilcher, J. V., Mfg. Co., Inc., Louisville, Ky.

Pfister Chemical Works, Inc., Ridgefield, N. J.

Pittsburgh Coke & Chemical Co., Pittsburgh, Pa.

Raymond Laboratories, Inc., St. Paul, Minn.

Scovill Manufacturing Co., Waterbury, Conn.

Standard Products Co., Detroit, Mich.

Standard Oil Development Co., New York City.

Stauffer Chemical Co., New York City.

Victor Chemical Works, Chicago, Ill.

Vulcan Copper & Supply Co., Cincinnati, Ohio.

Wallace & Tiernan Products, Inc., Belleville, N. J.

Westvaco Chlorine Products Co., New York City.

World Steel Products Corp., New York City.

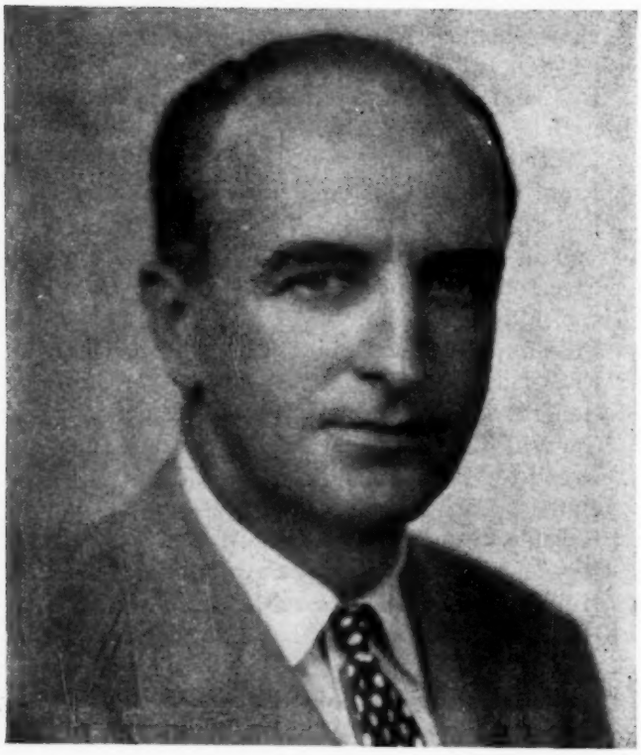
Wyandotte Chemicals Co., Wyandotte, Mich.

Zaremba Co., Buffalo, N. Y.

MEET THE NATIONAL OFFICER

Faced with the gigantic task of moldi the elected at the first annual meeting at Edgewood A here. Three of the Vice Presidents, Clifford L. Planning; T. H. Marshall, Chairman of Research a Chairman of Membership and Organization were for this issue. They will be presented in the Janu are pictured on other pages of this issue.

Your officers have been meeting regularly in membership as developments warrant. At the pre out whereby all military associations will eventu pattern a national preparedness project.



Colonel Ludlow King
President, Chemical Warfare Association

Colonel Ludlow King, AUS Inactive, is one of three brothers all of whom graduated from West Point and fought in World War II. His oldest brother was killed, he was wounded in Normandy, and his youngest brother won the Purple Heart with four clusters during combat in Europe.

Born July 4, 1908, at Okemah, Okla., he attended primary schooling in Washington, D. C., and graduated in 1930 from West Point, where he was captain of the boxing team and light heavyweight champion for three years. Also won his first track letter by breaking the Academy discus record.

Resigning from the Army shortly after graduation, he returned to his home state where he served as an engineer for the Great Lakes Pipeline Co. In 1935, his interest turned to sales when he joined the Great Western Sugar Co., and served as Assistant to the Sales Manager. In 1939 he joined the Owens Illinois Glass Co. and served in its New York office until the war.

Returning to the Army in May 1942, he was assigned the task of building the Chemical Warfare Service inspection force from an organization of ten civilians and officers to over five thousand. After serving as the first Chief of the Inspection Division, he was selected as the Executive Officer of the Materiel Command under General Rollo Ditto. In preparing for overseas duty, he then graduated from the CWS Basic and

(Continued on page 64)

R. Donald Rogers
Vice President, Chairman Finance

R. Donald Rogers, Chairman of Finance, is our financial wizard. Now an accountant in the Fiscal Division, Office, Chief of the Chemical Corps, Don has been giving much of his time to our accounting system, our funds, and is the watchdog of the bank account. He graduated from Columbus University with a BCS degree in 1941. He has been in the government service since 1936. He resides with his wife and daughter in Falls Church, Va.

Arthur Crossley, Vice President, is administrative engineer for the Potomac Electric Power Co., Washington, D. C. He lives in Arlington, Va., with his wife and three daughters. Entering the service in January 1942, Art wound up as acting Executive Officer of the Industrial Division, OCCWS, after serving as Chief, Engineering Section. He went over to GSC in May 1944, in OPD of the WDGS as an associate member of the Joint Logistics Plans Committee. Honorably discharged a colonel in January 1946.

Colonel Arthur Crossley, Cml. Res.
Vice President

CERS OF YOUR ASSOCIATION

...the future of our Association, the officers ...gewood Arsenal on May 24-25, 1946, are pictured ...lifford L. Sayre, Chairman of War Mobilization ...Research and Development, and Anthony D'Angelo, ...tion were unable to forward a picture in time ... the January 1947 issue. Other National Officers ...

...gularly in Washington, and will report to the ...At the present time a program is being worked ...will eventually be marching along together and ...

Colonel Harry A. Kuhn, Ret.
Special Assistant to the President

Colonel Kuhn was born in central Pennsylvania on 18 January 1895 and was educated at Pittsburgh High School. He attended Carnegie Institute of Technology, Chemical Engineering Department, from 1915 to 1917. He later was detailed to the University of Wisconsin, where he completed his under-graduate work in the Chemistry Department and completed his Master's in the Medical School. While on duty in Chicago, he was registered in the College of Medicine, University of Illinois, for two years as a candidate for a Doctor's degree in toxicology. Military duties took him to the Panama Canal Zone before he completed the required residence for his doctorate.

He has been a member of the American Chemical Society for the past 25 years and an associate fellow of the American Medical Association for approximately the same length of time. He is a member of Sigma Psi, College of Medicine, Illinois Chapter, and a member of the Federated Biological Societies and of the New York Academy of Sciences.

Colonel Kuhn is the author of a number of papers on insecticides and toxicological subjects, June 1917 as a civilian toxicologist in the War

(Continued on page 65)

Lt. Col. Harold B. Rodier, CWS, Ret.
Vice President, CWA
Editor, Chemical Corps Journal

Harold B. Rodier, Chairman of Publications, and Editor, is in his own publishing business. He lives at 4509 Ellicott St. N.W. In World War I he was in the Rainbow Division with the 168th Infantry. He has served as Editor of the Rainbow Reveille. He entered the service in World War II in September 1942. He was Chief, Information and Education Branch, Camp Sibert, until October 1944. Until December 1945 he served with I. & E. Section, MTOUSA. He was retired from the Army in July.

Roy Kulp, Chairman of Meetings and Conventions, lives with his family at 114 Post Road, Aberdeen, and commutes to his desk in Operations Division, Edgewood Arsenal, daily. His task of arranging for our annual meetings is a tough one, and no one envies him. However, Roy can be counted upon to do a good job for us, as he has been doing for CWS for many years.

Roy Kulp, Edgewood Arsenal
Vice President; Chairman, Meetings and Conventions

Peacetime Implications of Biological Warfare

By GEORGE W. MERCK

President, Merck & Co., Inc., Rahway, N. J.

(Reprinted by permission from *The Merck Report*)

Because of widespread interest in the subject of Biological Warfare as a weapon of national defense, as well as its fundamental advances of knowledge and practical contributions to science in times of peace, we present the text of an address delivered by George W. Merck at the "Science and Civilization" session of the George Westinghouse Centennial Forum at Pittsburgh, Pa., on May 16. During World War II, Mr. Merck was a Special Consultant to the Secretary of War, and Chairman of the United States Biological Warfare Committee. He recently received the Medal of Merit, the Nation's highest civilian award.—(Editor's note.)

BIOLOGICAL WARFARE no longer can be regarded as a laboratory experiment. It has advanced far beyond the laboratory stage, and its possibilities have been sufficiently explored to permit its serious consideration as an effective type of warfare. It is something which, first of all, must be given adequate attention in any comprehensive defense plan and the art of its use developed as a "threat in being" of equal importance to our potentialities in gas warfare.

Biological Warfare is not new. It was known in World War I, although employed only on a very limited scale. There is clear evidence that, in 1915, German agents inoculated horses and cattle shipped from the United States to the Allies with disease-producing bacteria. It might have been employed in World War II, for it offered an open avenue of attack upon us. That it wasn't developed and used by our enemies was due not merely to their inadequacies but assuredly to a conviction on their part that our potentialities in terms of scientific prowess and productive capacity were far greater than theirs.

Biological Warfare may be defined as the use—and the defense against the use—of bacteria, fungi, viruses, rickettsias, and toxic agents derived from living organisms (as distinguished from synthetic chemicals used as gases or poisons) to produce death or disease in men, animals, or plants. It may be directed against military or naval forces, civilian populations, livestock, or crops. Employed against personnel, it may cause fatalities, or only incapacitate; the duration of illness may be brief or protracted; the causative agents used may be persistent or nonpersistent; they may spread readily from infected to healthy persons, or they may be of a type which produces noncontagious disease.

In the years between World Wars I and II, an interest in Biological Warfare was maintained by scientists and military men in many countries. In several of these countries this type of warfare was believed to be possible or even probable.

In the fall of 1941, opinion in the United States regarding the value of Biological Warfare was by no means united. But common prudence dictated to those responsible for the nation's defense that they give serious consideration to the dangers of possible attack. The views of scientists, alert to its dangers, were made known to the Secretary of War. Thereupon, Mr. Stimson promptly requested the National Academy of Sciences and the National Research Council to give him the benefit of the best scientific advice available concerning this problem.

After an intensive and thorough study by a special committee of biological scientists, the Academy and the Research Council advised the Secretary of War that Biological Warfare appeared distinctly feasible, and urged that appropriate steps be taken for defense of the nation against its use. The report stated in part:

> "The value of biological warfare will be a debatable question until it has been clearly proven or disproven by experience. The wise assumption is that any method which appears to offer advantages to a nation at war will be vigorously employed by that nation. There is but one logical course to pursue, namely, to study the possibilities of such warfare from every angle, make every preparation for reducing its effectiveness, and thereby reduce the likelihood of its use."

The advice given to the Secretary of War, coupled with reports of enemy activities in this field, prompted the President to direct the initiation of intensive, large-scale investigation in the United States of the possibilities and potentialities of Biological Warfare, and the establishment of active collaboration in this field with our British and Canadian allies.

While Biological Warfare was not actually used in military operations, the objectives were attained. Defenses against a potentially dangerous method of warfare were devised, and the likelihood of surprise from this quarter was forestalled.

An Example of Teamwork

The work done during the war not only scored tangible advances but also demonstrated the effectiveness of the type of teamwork the subject

demanded. Our investigations were carried on by a combined organization in which the Army, the Navy, and civilian scientists (in and out of uniform), universities, private research institutions, industries, and several departments of the Government—chief among them the U. S. Public Health Service and the Department of Agriculture covering both animals and plants—all worked together with allied teams in a most effective manner. Adequate protection against the possible use of Biological Warfare by our enemies was a matter of great urgency and was attacked with zeal and energy and with the unstinted support of those directing the war effort.

Starting as a project under the most extreme secrecy, the work was undertaken under the wing and cloak of the Federal Security Agency. Emerging from this "cover" (but not from secrecy) the Army, with the Navy collaborating, took over. Unique facilities were built by the Chemical Warfare Service and by the Navy for experimentation on pathogenic agents.

While the main objective in all these endeavors was to develop methods for defending ourselves against possible enemy use of Biological Warfare, it was necessary to investigate offensive possibilities in order to learn what measures could be used for defense. Accordingly, the problems of offense and defense were closely inter-woven in all the investigations conducted. Consideration of the problem from an offensive point of view necessitated numerous new developments and concepts.

At the height of its development, the Special Projects Division of the Chemical Warfare Service of the Army, which carried the main responsibility for the Biological Warfare program, had a personnel of almost 4,000. Of these, 2,800 were Army personnel, approximately 1,000 Navy, and about 100 civilian. In addition, the Navy had a separate group of almost 100 at work on a special phase of the problem. The work of these groups, and that done in the universities, research institutes, and industries, represented a truly combined operation in which Army, Navy, civilian personnel, and allied groups worked together in the closest co-operation. They worked under high pressure and under strictest secrecy. Their achievements were numerous.

Some General Accomplishments

In general terms, the following were some of the chief accomplishments:

I. *The development of methods and facilities for the mass production of pathogenic micro-organisms and their products.*

Among others, one problem, new to large-scale production of pathogenic micro-organisms, involved the prevention of contamination of air, water, and land surrounding the experimental stations. That the procedures developed were effective is proved by the fact that no accidental infection occurred outside the boundaries of the experimental areas.

Here is an anecdote which illustrates the point:

> The doubts of the health authorities of the municipality in which the main Biological Warfare experimental station was located were aroused regarding the adequacy of the sanitary measures. The local health officer determined to test the sewage of the establishment where it entered the city system. Imagine his surprise when confronted with the baffling fact that his tests showed the sewage *sterile*—perhaps the only sterile sewage in the world! Had he tested the ventilating outlet flues from the laboratories and pilot plant operations, he would have found them sterile, too.

II. *The second accomplishment was the development of methods for the rapid and accurate detection of minute quantities of disease-producing agents.*

Much progress was made in developing procedures for this purpose which were highly sensitive and selective. These will be of value in peacetime work in laboratories, hospitals, and industries.

III. *Significant contributions to knowledge of the properties and behavior of air-borne, disease-producing agents.*

In this work, precise methods were developed for producing and measuring "clouds" of micro-organisms for determining the viability of the organisms in such "clouds," and for studying the factors controlling movements of air-borne pathogenic agents.

It is easy to visualize the importance of these categories of achievements when one considers the problems in ventilation brought by modern problems of war: increase in size and underwater range of submersible craft; ventilation of bomb-proof shelters, hospitals, and factories.

IV. *For the first time, a pure, crystallin, bacterial toxin was isolated and studied.*

This was the toxin of *Clostridium botulinum*, type A, which is the most potent biological poison known to man. Knowledge gained in this work will open the way for the isolation and purification of other bacterial toxins, and will undoubtedly make possible the preparation of more effective substances which can be used for the immunization of men and of animals against such toxins.

V. *The development of vaccines for the protection of chickens against two highly fatal poultry diseases known as Newcastle disease and Fowl Plague.*

VI. *Advances in the treatment of certain infectious diseases of mammals, including man.*

Although extreme care was taken to protect personnel against infection, a few cases of disease attributable to laboratory accidents occurred. All of these were treated successfully, and the knowledge gained from the treatment of these cases will be of value to the medical profession.

[I would like, at this point, to interrupt the reading of the record to pay a tribute to the men and women, the officers of the U. S. Army and the U. S. Navy and their civilian associates; and to the soldiers, the sailors, the WACS, and the WAVES, who month after month subjected themselves to the risks and dangers of the work in which they were engaged. They are among the unsung heroes of the war.

I have seen experienced physicians and bacteriologists visiting the experiment station stand aghast when they realized what was going on about them. Their sighs of relief, when they left the secured areas, were not put on, I assure you.

Nor should the achievement of those responsible for the direction, design, and planning of the specialized operations which in such a high safety record go unnoted. Only a few, because of special circumstances, have been given public recognition. I hope that, as secrecy is lifted and more of the achievements of this group are revealed, some kind of Unit Citation will be awarded these men and women who demonstrated courage and patriotism of the highest order.]

VII. *The development and large-scale testing of a vaccine for the protection of cattle against rinderpest, a highly fatal disease of cattle which might have been introduced into this country by accident or by enemy action.*

This work was done by a joint United States-Canadian Commission. This project will be discussed in greater detail later.

VIII. *Extensive studies on the production and control of diseases which might affect crops of economic importance.*

In this work, fungus, bacterial, and virus diseases of crop plants were studied intensively.

IX. *Information was obtained regarding the effect of more than 1,000 different chemical agents on living plants.*

This is a particularly fertile field and one that promises much to agriculture in the form of weed-killers and selective plant-control agents. The work was initiated to find destructive agents against various crops and was successful. Only the rapid ending of the war prevented field trials in an active theater of synthetic agents which would, without injury to human or animal life, affect the growing crops and make them useless.

Applications of certain of these agents, even in infinitesimal dilution, had shown that they were capable of depriving the enemy of the benefits of his own labor by depriving his garden and field crops of their fruits. Not until he had carried through the labors of cultivation would he find that the roots had grown sere and that the plant must wither away without yield.

Peacetime Implications

The scientists who were in charge of this work are leaders in their fields—as were all the scientists in charge of the various projects. They have stated that *eventually any living plant process may be brought under control through critical use of some growth-regulating substance. This means that every agricultural or horticultural practice which affects growth, development, ripening, or storage, can be influenced, to economic advantage.*

The pattern of the plant projects is no different from the general form of the entire Biological Warfare program and its other divisions, the animal and the human. It is obvious in all of them that there cannot help but be important advances in knowledge—many of them fundamental—and gains in scientific achievement—many of them capable of practical application. In fact, it is quite impossible for work to be done in this field without such results. *It is inherent in the nature of the work.* Perhaps no other type of warfare can bring with it such a guarantee of good: economic advantages in agriculture, parallel gains in animal husbandry, and, above all, vital contributions to the fight against human ills and suffering.

Many of the detailed results of the research performed now are in process of publication in scientific journals which represent every phase of biological science. These papers will serve as concrete evidence of the job that was done—and as the work continues, more will appear.

All scientific knowledge, the publication of which does not involve the disclosure of vital military information, should be published promptly and fully. The Secretary of War, Mr. Patterson, has expressed himself emphatically in agreement. He has indicated that this is and will be the policy of the War Department. Also, in reviewing present plans with the Chief of the Chemical Warfare Service, General Waitt, he has stated that he wholeheartedly supports this policy and has issued instructions that it be carried out. And Admiral McIntire, the Surgeon General of the Navy, who has under his charge the naval ac-

(Continued on page 40)

IMPORTANT *News* FOR INDUSTRY

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PEACTIME IMPLICATIONS

(Continued from page 38)

tivities in Biological Warfare, has asked that he be recorded as concurring and taking similar action.

It should be mentioned, too, that the Special Committee for Biological Warfare, formerly known only by cryptic alphabetic designations, is being continued by the National Academy of Sciences, and to this committee will be referred, as was the original problem in 1939, current questions relating to policy, including decisions on publication. With such a policy, no question of military domnance can be raised. And so far as I know, it never has been raised in connection with the Biological Warfare program.

Prediction of the results of scientific inquiry is not easy; neither is it safe. There are too many "ifs." But most of these "ifs" grow out of the almost universal practice of research workers to indulge in what Horace Walpole called "serendipity."

You perhaps recall the story of the three princes of Serendip (the ancient Kingdom of Ceylon) who, faring forth on an errand, returned not with what they sought, but always found and brought back something of greater value. Hence, "serendipity." It means the making of unexpected discoveries by chance and by acute observation along the road toward some main objective.

The Rinderpest Activity

I can best illustrate some of the potentialities of research in this field by recounting briefly the accomplishments of the American-Canadian team which worked during the war to develop defenses against rinderpest of cattle. It is quite apparent that the value of this project in peacetime will be as great as, if not greater than, its value in meeting the wartime emergency.

In 1941, when considering the diseases of livestock which might be introduced on this continent, either through accident attributable to rapid air traffic or by deliberate enemy action during the war, rinderpest, an exceedingly contagious malady of cattle with a very high mortality rate, stood out as one disease against which every possible precaution should be taken. With a one hundred percent susceptible cattle population of many millions on the North American continent, it would have been catastrophic to our food supplies had this rapidly spreading virus disease appeared.

Our Canadian allies had arrived at the same conclusions with regard to rinderpest, and were in full agreement with us regarding the importance of promptly undertaking measures to place us in the best position possible to defend our vast and critically essential cattle population against this possible threat.

The result of this combined effort was the discovery that after the bovine rinderpest virus had been successively passed through some fifty developing chick emphryos it had become avianized to the point where it would not produce appreciable disease in cattle. As a matter of fact, only very minor reactions were found to follow its injection into suceptible animals. On the other hand, cattle receiving injections of this avianized virus were subsequently found to be substantially immune when exposed to the fully virulent bovine virus. The new vaccine has been subjected to a wholly successful field test in Africa through the co-operation of our British allies.

These findings immediately pointed the way to the means for providing protection for millions of our cattle with a vaccine which could be produced in huge quantities without the many difficulties involved in producing the bovine tissue type of vaccine. Thus, had rinderpest unfortunately made its appearance on this continent during the war, we would have been prepared to cope with it in a manner heretofore impossible. Aside from the insurance provided by the rinderpest investigations and their results during the war period, the findings and knowledge gained from this work will be of great postwar value.

Now a method for the economical production of an effective type of rinderpest vaccine is available for use in countries and localities where the disease has been a crippling plague of livestock.

In Conclusion

My purpose in referring to the work and achievements of this particular project is to illustrate the peacetime implications of the entire program. The work resulted in building up an adequate defense. It has made that particular agent impotent as a weapon in Biological Warfare. (One might give a thought to this paradox: While we perfect a biological weapon, we perfect the defense against it, thereby destroying the weapon. Would that all weapons of war could be liquidated from the earth as simply as this.)

Research in Biological Warfare gives a firm promise of the control, on a world-wide scale, of many diseases afflicting man and beast and plant life.

These investigations, and the revelation of their inherent quality of producing not only weapons and defenses but also fundamental advances of knowledge and practical contributions to medicine and agronomy, *have necessitated the writing of a new chapter in Biological Science.* There still is much to be done.

Those responsible for our defenses and preparedness in this upset world are alert; they have

(Continued on page 66)

Were Japs Defeated by CWS Incendiaries?

By CAPTAIN JOHN H. MUNHALL, *Cml. Res.*

AT EXACTLY fifteen minutes past eight on the morning of August 6, 1945, there occurred an event that will live forever in the minds of all men, particularly the Japanese. For it was at that hour that Hiroshima cringed before the flash of the atomic bomb.

Now, as we are entering the "atomic age" with memories of the carnage of Hiroshima and Nagasaki rekindled by the recent Bikini tests, it may be hard to recall any of the other circumstances that led to the surrender of the Japanese. A fair appraisal of all circumstances—and there were many—could not fail to single out the CWS incendiary bomb for proper recognition.

Though comparisons in this connection would be open to criticism from many quarters, those who wish to cite the incendiary bomb as the biggest contributing factor to Japan's final defeat and surrender would certainly be entitled to their say in any fair analysis.

Long before the first atomic bomb was loosed, long before our land, sea and air forces were poised for the final thrust and long before the Russians marched, Japan had been dropped to her knees, powerless to avert the knockout punch, by five months of heavy, concentrated and terribly destructive fire-bombing. She had cracked and was about to come apart at all her oft-patched seams.

Observers of the Japanese scene saw first-hand evidence in abundance indicating that without the atomic bomb, without further help from our forces or the Russians, Japan in August of 1945 couldn't have hung on much longer. She was thoroughly demoralized, economically crushed, industry was at a standstill and, with her top-heavy bureaucratic government panicky, there were portents of revolution.

Men and women, many of them nearly naked and with most of their possessions destroyed, roamed city streets in agonized confusion or fled to the countryside, disregarding the flood of orders and counter-orders from the police and the government. One worker at Musashino said: We had no food, no clothes and no houses. We couldn't work because we had to spend all our time just trying to live."

An industrialist said: "Your B-29's didn't destroy our factories as much as they destroyed the people. We were nervous wrecks; everyone was tired of war. The atomic bomb didn't defeat us, but it gave the Emperor a chance to end the war despite the army's demands that we continue fighting. If the war hadn't ended, there would have been revolution."

A foreigner, who was in Japan through the fire-bombings, said: "After the first Superfort raid with fire-bombs, fear became so great that workers began remaining at home merely because they were afraid to be in plants where another raid might strike."

Expressions such as these came, unsolicited, from all quarters whenever one entered any of the four great industrial areas which bore the brunt of the incendiary attacks: Tokyo-Yokohama, Nagoya, Osaka and Kobe. This observer saw all parts of Tokyo and Yokohama and flew low over most of the rest of Japan, and the damage in industrial areas was incredible, even when one had been fully briefed on what to expect.

From Atsugi air field, outside Yokohama, heading to Tokyo on a muddy, rutty ribbon of road, one could not but marvel—for all the tragedy the scene represented—at the horrible thoroughness with which the incendiaries had done their deadly duty. For as far as the eye could see on both sides of the road stretched great plains of rubble, with only an occasional grotesque, misshapen pole or pillar left standing in the glass, tin, and powderized mess of ruins.

This was true in all of Tokyo and Yokohama, except for the more modern areas. And even there, some mighty steel and concrete buildings, including the undeniably beautiful public institutions and hotels of Tokyo, which were doubly impressive from a distance in contrast to the leveled structures around them, looked less proud when viewed at close hand. Windows were blackened and gaping, with tattered drapes fluttering eerily. Facades and roofs were seared by the tremendous heat of incendiary fires. There was little doubt as to what caused the damage. Nowhere was there a bomb crater to bear mute tribute to high explosives. The tell-tale evidence was found all around the lucky buildings that escaped. Firebrick chimneys standing as lonely sentinels. Hollow stone buildings with their guts burned out.

Observers moving about Tokyo and Yokohama for the first time following the end of the war saw Japanese, adults and children alike, turn dark eyes fearfully toward the sky whenever deep, full-throated roars signalled the presence of bombers overhead. They knew that the war was over and no more fire would come plummeting from the blue skies. But the fear in their hearts would betray their nervousness for a long time to come.

Among the most bizarre sights in and around

(Continued on page 66)

Experience rates an "E", too!

Outstanding among the factors which enabled Lambert Pharmacal Company to win 5 wartime Army and Navy "E" awards were the many years of expert experience in doing the very type of job called for. Available to the Government overnight was all the "know how" and technic of production acquired throughout more than 60 years of leadership in the mass production of pharmaceutical products.

Raw materials used by the Lambert Pharmacal Company are carefully assayed in our Analytical Laboratory. The titration table shown in this photograph is typical of such equipment used in the Analytical Laboratory. Carefully standardized solutions automatically supply the burettes used by the analyst in carrying out such assays.

For the precise determination of small amounts of certain chemicals, the spectrophotometer, shown here in use, utilizes the "electric eye". It is far more sensitive than the human eye. In pharmaceutical manufacture small amounts of contaminating materials can have a deleterious effect on the final product. The spectrophotometer is constantly used in the Lambert laboratories to determine the amount of contaminating elements in raw materials.

Rabbits have been utilized by Lambert in its dandruff research. The rabbits were inoculated with Pityrosporum ovale; which is believed by many dermatologists to be a causative agent of infectious dandruff. After infectious dandruff developed the rabbits were treated, on one side only, with Listerine Antiseptic once a day. Marked improvement on the treated side was noted within 14 days on the average. The untreated side of the rabbit showed typical evidence of dandruff even a month after inoculation.

LAMBERT PHARMACAL COMPANY
St. Louis, Mo.

RA Commissions to Chemical Officers

IN THE early part of 1946 the Army was faced with the colossal problem of selecting 10,000 men to be integrated into the Regular Army. These officers were to be chosen from among 800,000 who saw temporary duty in the Army of the United States during the war.

Briefly, the procedure was this: A few days after an officer submitted an application for a permanent commission he was instructed to report to the nearest Personnel Center. There he was given a thorough physical examination and a test of knowledge. The latter eliminated those who lacked the mental alertness, learning and ability needed to advance in responsibility and rank. The physical examination eliminated those who did not come up to Army standards.

Every officer who proved himself physically and mentally acceptable received a Biographical Information Blank. This was not a "quiz" since he could choose the answer which seemed to apply to him—most of the questions concerned himself. His choice of answers revealed his background and experience, his opinions of himself, his attitudes toward an officer's job and toward others.

Next the candidate was interviewed by a board of senior officers. They knew nothing about the candidate until he appeared before them and on the basis of their definite observations the board members gave the candidate a rating.

Meanwhile, three commanding officers under whom the applicant had previously served had sent an Officer Evaluation Report. This individual evaluation was to be made out and returned describing the officer and the way he performed his specific assignment. This was supplemented by statements concerning the way he handled men, how he accepted responsibility, etc.

There were over 108,000 applicants throughout the Army; 1408 officers applied for a permanent commission in the Chemical Warfare Service. Of this number 79 officers were chosen and are listed:

Majors: Ragnar E. Johnson, Nelson McKaig, Jr., Robert N. Isbell, Rura O. Ball, Gares Garber.

Captains: Fred J. Delmore, William E. R. Sullivan, Donald D. Bode, William J. Allen, Jr., William W. Campbell, Charles A. Cain, Adam W. Meetze, Nelson I. Decker, Arthur A. Weinland, Joe B. Michael, Donald E. Yanka, Arent O. Wiken, Joseph F. Escude, Edward V. R. Needles, Walter W. Kuehler, Timothy C. Williams, Carl J. Koenig, Francis X. Webster.

First Lieutenants: Chester Dombrowski, James A. Richardson, George E. Danald, Joseph S. Brinkley, Jr., John C. Hinchie, C. M. Schmelzle, William R. Milburn, Carl E. Grant, John G. Hoffman, Jr., Joseph C. Prentice, Harold W. Wheeler, Carl S. Casto, Samuel J. Boyles, Milton D. Sprinkel, Frank M. Arthur, John J. Hayes, Charles C. Micheau, William A. Williams, W. S. Hutchinson, Jr., Feris A. Bass, Jr., Benjamin G. Moore, Howard G. Schade, Martin L. Denlinger, Benjamin R. Bierer, Robert A. Wys, Joseph C. Hiett, Thomas E. Marfing, Ernest H. Davis, Richard C. Burn, Dale L. Vincent, Sam Efnor, Jr., Marshall L. Fallwell, Thomas A. Gibson, Jr., James O. Quimby, Jr., Bruce K. Thomas, Woodford T. Moseley, Clifton O. Duty, George H. Young, Jr., James H. Watts, Michael F. Hochella, Joseph C. Braxton, David W. McKinney, Sidney L. Wells, Patrick H. Seay, Marsh S. Marshall, James H. Muhl, W. G. MacFarlane, Vernon E. Dehner, Roy E. Branson, L. K. Martin, Harold S. Fischground, Jerry F. Gleason, Jr.

Second Lieutenants: William C. Lafield, Jr., George D. Bartels, Carl R. Duncan, Edwon C. Pittenger, Jr.

It is anticipated that 25,000 additional officers will be integrated into the Regular Army. Of this number, Chemical Warfare Service will receive its proportionate share. Applications will be reopened and those who choose the Army profession and those who were not appointed and are on the eligible lists will receive reconsideration.

The grades of the applicants are determined by their ages: 28 and under, second Lt; 28 to 35, first Lt; 35 to 42, Captains; 42 to 48, Majors. If an applicant is under 28 and has completed three years active duty he is eligible as a first lieutenant.

The following-named officers were commissioned in the Regular Army subsequent to the publication of the above-named officers:

Major (Lt. Col.) Clarence H. Breedlove, Lawton, Okla.; Major (Lt. Col.) Clifford P. Holm, New Effington, S. Dak.; Captain (Lt. Col.) John F. Babcock, Glendale, Calif.; Captain (Lt. Col.) Carl V. Burke, Edgewood Arsenal, Md.; Captain (Col.) Theodore P. Gahan, Medford, Mass.; Lieut. (Major) Vincent C. Bethman, Cambridge, Mass.; Capt. (Col.) Victor C. Searle, Boonton, N. J.; Capt. (Lt. Col.) Henry R. Sanford, Bath, N. Y.; Capt. (Major) Douglas Stevens, Palestine, Texas; Capt. (Lt. Col.) Calixto C. Valle, Rio Grande City, Texas; Lieut. (Col.) Virgil F. Fairfax, Charlotte, N. C.; Lieut. (Lieut.) Merritt W. Briggs, Jamestown, N. Y.; Lieut. (Capt.) Donald G. Namara, Jersey City, N. J.; 2nd Lieut. (Lieut.) Francis C. Lozito, Newport, R. I.; 2nd Lieut. (Lieut.) James E. Devine, Edgerton, Wis.

Famed 4.2 Rides Waves

By MAJOR R. H. SKINNER, *CWS*

(A vivid account of the use of the 4.2 mortar in landing operations, this contribution, written during the hostilities, is especially timely in the face of the Mead Committee attack on the 4.2.)

CHEMICAL WARFARE'S pride, the 4.2 Mortar, has forged its way into the hearts of the Navy and has now become an all-service weapon. We have all read headlines of "Capture of Oran laid to Chemical Warfare's 4.2 Mortar"; "4.2 Mortar saves the day in Sicily", and "4.2 turns Germans back at Anzio". Now it can be told that the Navy's new secret weapon which has devastated the Japs in the Amphibious Landings in the Pacific is this same 4.2 Mortar mounted on LCI's. The Mortar has a rifled bore of 4.2 diameter. The maximum range when mounted on an LCI is in excess of 3,000 yards. There are several of these Mortars mounted on each LCI. These Landing Craft, Infantry are about 157 feet long and 25 feet wide, have a maximum speed of about 16 knots and are extremely maneuverable.

In Amphibious landings there has been a critical period during the assault and establishing of the beachhead before the landing of the artillery. The Japs favorite weapon is their mortar and their tactics have been to emplace these behind protective slopes and from there pour devastating fire on the landing waves. American Army troops prefer to blast their way with artillery and then move in and take possession. Naval gunfire must provide the protective barrage during this period. The gunfire from Destroyers, Cruisers and Battleships provides the heavy artillery, but they cannot reach the Jap mortars. "Set a thief to catch a thief" translated to war parlance emerges to "Neutralize a mortar with a mortar". Chemical Warfare's 4.2 is the king of mortars. The Germans call it "Automatic Artillery", and the Japs are convinced it is a "huge machine gun". One mortar can fire in excess of 20 rounds per minute and an LCI with several of these can cover a large area in short order. It out-ranges the Jap mortar and because of the rifling in its barrel, it can be used against a point target. One General Officer in Sicily has stated "Without exaggeration, I would say that the 4.2 is the most effective single weapon used in support of Infantry I have ever seen".

Photo is of LCI 660 (with Major Skinner and Lt. Commander Hannett) showing mortar ships firing on beach over the first wave which can be seen just about to beach at Lingayen.

Colonel George F. Unmacht, Dubuque, Iowa, Chemical Officer, Pacific Ocean Area, had been experimenting with a sea-going 4.2 for several years and the Navy became equally interested. In July and August of 1944, three groups of LCI Mortar Ships were equipped and ready for battle. These ships were a new experiment in several ways. They were operated by Navy crews, but the Mortars were manned by Army troops commanded by Chemical Warfare Officers. One group with troops commanded by Major L. E. Anderson, CWS, was included in the attack on Palau while the other two groups with troops commanded by CWS Officers, Major Richmond H. Skinner of Chestnut Hill, Mass., and Captain Wayne M. Parks of Hamden, Conn., headed for the southwest Pacific and the Philippines. These Army troops were 98th Division Infantry Mortar Troops specifically trained for this work under the direction of Lt. Col. R. P. Fournier of Edgewood, Md., CO, 14th Cml Composite Bn.

At Leyete, one group accompanied by LCI rocket ships led in the first wave as a blocker in football opens a hole for the ball carrier. Such concentration was laid down that the landing troops failed to find a live Jap in the first 500 yards. One trench was seen full of dead Japs without a wound—killed from the terrific concussion. Next was a road and bridge over the Daguitan River just south of Dulag Village. Here the Japs were rushing in reinforcement tanks. Firing on an unseen target using calculations from maps, the tanks were dispersed and prevented from crossing the river until our troops took possession twenty minutes later. For several hours the south flank of the river was kept neutralized and all enemy fire silenced giving succeeding waves their chance to move in.

Catmon Hill and its strong point, Liberanan Head, were the responsibility of the second group. This was a nest of mortars, 75 and 105 howitzers. The larger guns were the targets of our Destroyers and Cruisers, but the Jap machine guns and mortars must be silenced and here the mortar ships really took them by surprise. Only once did any real concentration of enemy fire take effect on the landing ships. A quick shifting of position of one LCI mortar ship—a quick volley and only "good" Japs remained.

The result of these operations was all the Navy needed—they were sold lock,stock and barrel! From one task group commander "you were superlative—mere words cannot express my commendations". From another "the gallantry displayed by the crews of the LCI gunboats and mortar boats was outstanding. The tremendous rocket and mortar barrage laid down by these ships and their devastating gunfire along the beaches contributed materially to the successful landing of our troops with minimum casualties. With mortars and gunfire they kept the left flank of our forces continually neutralized. By their outstanding gallantry in the face of enemy fire, performance of duty, and successful accomplishment of their missions, the personnel of the LCI gunboats and mortar boats have made for themselves and their craft an enviable record in amphibious operations."

A new technique had been developed and the Navy started in to equip many more such ships. Another group was added to the units used at Leyte. To man these mortars, Chemical troops of the 98th Chemical Mortar Mtz. Bn. were borrowed from the 6th Division who were to be landed at Lingayen. What more logical use of troops could be planned? Chemical Mortar Troops firing chemical mortars from the ships leading the landing of their troops and protecting them with barrages until their beachhead was established and their own mortars put ashore. These troops then disembarked, found their own mortars and went into action supporting the advance.

At Lingayen, the versatility of the mortar ships was again displayed. They formed a line off-shore and hammered the beach with a preliminary softening-up fire giving protection to the waves forming up behind. Then with ever changing range they led the waves in, a rocket ship abreast a mortar ship, continually pounding the beach. At 300 yards from the beach the depth of the water prevented the further advance. The rocket ships quickly withdrew and the waves passed through headed for the beach. No longer on their own as in past landings the troops in the small boats waved encouragingly and gratefully for they knew the mortars were staying right there to give them coverage. As the troops landed and moved forwarded the mortar screen was lifted inland in front of them—as they dispersed and moved down the beach, the mortar ships accompanied for "call" fire and protection during river crossings. One Jap Battalion was dispersed by a group of the mortar ships at the one such crossing. Two small harbors were taken by a group of rocket ships with mortar ships providing the artillery to protect them.

All of these operations were successful due to perfect team-work between the Army and Navy. Skillful ship handling by the Navy is a major requisite. Lt. Commanders George W. Hannett of Albuquerque, New Mexico, and Carl F. Robison of Richmond, Va., worked with exceptional skill in maneuvering and training the ships of these two groups. In a letter to Major Skinner at the end of the Lingayen Operation, Flotilla Commander Captain Theodore W. Rimer wrote, "It is with deep gratitude and sincere pleasure that I convey to you and each member of your unit the admiration and highest esteem that we of the Navy feel for your splendid performance of duty during the Leyte and Lingayen Operations. It is with regret that we see you, truly *our shipmates*, leave this command. May you rest assured that your initiative, co-operation, and extreme devotion to duty was a decided contributory factor to the splendid success of each operation. I wish you all continued successes and to all hands Well Done."

As this is being written these mortar ships augmented by many others, recently equipped, are doing their share at Iwo Jima. The Army Troops, having done their work in developing the technique with the Navy, are back on land again. Navy crews have taken over but these and future crews will train under Army's Chemical Warfare experts.

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Crossroads Able and Baker

By COLONEL L. E. FELLENZ, *CC*

THE opportunity to witness the atomic bomb trials at Bikini as an official observer for the Chemical Warfare Service was one which held a very keen interest for me, and I started the mission with a feeling of curiosity and perhaps a little of adventure. I must admit that, as the days wore on and we came closer and closer to the actual trial, this interest and curiosity became tinged by a little apprehension which I am sure all of us shared. Of course, we all knew that this apprehension was groundless, but the element of the unknown was certainly with us and took an increasing part of our thoughts until after the first bomb drop.

Colonel L. E. Fellenz, CC
C.O., Camp Detrick

My ship was the *USS Blue Ridge*, a Navy Headquarters ship, which I boarded on the morning of June 12th at Oakland, California. We sailed at about 1030 with Hawaii our first destination. This first part of the trip was quite uneventful, and our time was spent playing volley ball, ping pong and bridge, reading and just plain loafing. The weather was reasonably good, and by the second or third day out all of us had our sea legs and were enjoying the trip thoroughly.

We reached Hawaii on June 18th and were there for a couple of days. I had a chance to visit Schofield Barracks and some of the other installations that I had known when I was there sixteen years ago. I found many of the places greatly changed and going to Schofield was like walking into a strange post that I had never seen before. However, a number of old friends whom I met helped to dispel this feeling of strangeness and our stay on Hawaii was a very pleasant one for me.

We left Hawaii the afternoon of June 20th en route to Kwajalein. This part of the trip was very much like the first part, and we were all glad when we reached Kwajalein on the 28th. Actually, Kwajalein is not much of a place, but it was a chance for the feel of solid ground and for a swim, both of which were welcome. We left Kwajalein that same day, and when I awoke the next morning I could see the ships in Bikini Lagoon.

It was quite an impressive sight for me to see so many ships of all sizes and descriptions assembled together. There were a number of ships, too, that had quite a historical interest, and some of the naval personnel pointed out the old battleship *USS Nevada*, the Japanese battleship *Nagato* and the German heavy cruiser *Prinz Eugen*. The *Nevada* had been painted a bright orange except for the upper decks which were white, and it looked very gaudy, especially when compared to the other ships. The *Nevada* was to be the target ship and the bright colors were, of course, to enable the bombardier of the B-29 carrying the atomic bomb to spot the *Nevada* easily.

We made a tour of some of these ships, going aboard the *USS Nevada*, the *USS Independence* and the Japanese *Nagato*. The *Nagato* had been badly damaged by our B-29s in Tokyo harbor, and it was amazing to me that it had been able to come all the way from Japan under its own power.

The next day was Sunday, June 30th, and after church services we were told that the next day would be Able Day, the day of the first bomb drop. This announcement caused quite a stir because we all had expected to have to wait for several days for the necessary good weather. We had several more briefings in regard to safety regulations and the various rules and regulations we were expected to follow. . I hadn't mentioned this part of the affair, but we had a great many lectures on the atomic bomb and the experimental plans for the test we were to witness. Among the speakers whom we had were Admiral Blandy and Maj. Gen. McAuliff.

In the afternoon we had a practice run for the bomb drop, and I am sure that many of us would have been quite willing to have let the entire matter go at that. The apprehension that I mentioned earlier had gotten practically everyone by now, although we knew that the planning had been exhaustive and that every possible contingency had been thought of.

(Continued on page 48)

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CROSSROADS ABLE AND BAKER

(Continued from page 46)

The bomb was scheduled to be dropped at 0830 so everyone was up at the crack of dawn and breakfast was served at 0600. We all went up on deck and drank coffee and milled around swapping guesses and passing time. After what seemed like hours we were told to take our stations for the explosion. It was then 0850, the bomb drop having been postponed half an hour. The safety regulations were again carefully read and explained in minute detail. At H-2 minutes we were ordered to put on our safety goggles and keep them on until told that we could remove them. The next two minutes were the longest I think I have ever experienced. I couldn't see a thing through the goggles, and I just stood waiting for something to happen. Finally, there was a brilliant flash on the horizon, followed immediately by the appearance of a huge ball of flame.

I took off my goggles and could see a tremendous ball of flame and smoke making a sort of white and orange cloud shooting vertically up into the sky. Under this vertical cloud and spreading along the surface of the water was a huge flat black cloud. In a short time the vertical cloud assumed the typical mushroom appearance and the lower cloud obscured the ships in Bikini Lagoon.

About 1100 the ship got under way and we headed in for Bikini Lagoon. As we got closer we could see several ships burning and occasionally there would be an explosion from some of the ammunition which was left stored in some of the ships for test purposes. That night we anchored about a mile and a half from the target ships and all hands were warned not to use sea water for any purpose until our scientists had checked and made sure that it was safe. The next morning we moved in a little closer and we could see that the damage to some of the ships had been extensive; other ships looked as if nothing had happened to them. At 1300 we were all loaded on small boats and cruised around among the target ships. The *USS Independence* seemed to have been very badly damaged and the Japanese heavy cruiser *Sakawa* had already sunk. The target ship, *USS Nevada*, was entirely black on one side from the blast which had hit it. It is nearly impossible though for me to evaluate the damage that I saw. The decks and superstructure on many of the ships were damaged and blackened from the terrific heat and I wondered what it would have done to any exposed personnel on deck. Again I felt a slight feeling of disappointment. I had expected to see great holes in the sides of the ships, and masses of metal which had been melted by the heat of the explosion, and I had expected to see many more ships sunk. Even though I felt this disappointment, I realized that the atomic bomb was a thing of terrific destructive power; something that transcends the ability to realize, for there is nothing in one's previous experience with which to compare it.

The afternoon of July 3rd it was decided that it was safe for us to board some of the ships to see the actual damage. We went aboard the *USS Pensacola*, which did not look too badly damaged as we were approaching it. However, when we got on board it was an entirely different story; my initial feeling of disappointment was entirely dispelled and my respect for the atomic bomb was definitely increased. Her main deck was squashed in, all of her superstructure was a mess and the two stacks were just pushed aside, and nearly all of the Army equipment on deck was entirely ruined where it was not sheltered from the blast. We also went aboard the *USS Saratoga* and the German *Prinz Eugen*, neither of which had sustained major damage. The next day we went aboard the *USS Nevada* and the story here was much the same as on board the *USS Pensacola*. Of course, I was particularly interested in the Army equipment which had been lashed on deck; most of it was completely ruined. The opinion was expressed by a number of people that it would not have been damaged so badly had it been loose so that the blast could have pushed it across the deck. As it was, it was fastened down very firmly and suffered badly from the blast and from fire. That afternoon we had quite a series of lectures from scientists who gave us the dope that was available and also told us a little about what to expect when the next bomb was exploded under water. They also told us why the flash was not as bright as we had expected. The explanation was that a good deal of it was shrouded by steam and water vapor.

If the bomb had been exploded on dry land, particles of dust would have been blown up by the explosion and become incandescent and thus contribute to the flash, but this, of course, does not happen when the bomb is exploded over water.

On July 5th we sailed for Kwajalein and then on to Majuro, crossing the equator on July 10th; a large number of us were initiated into King Neptune's domain at this time. We went on to Ponape, Truk and Guam, finally arriving back at Bikini the night of July 24th. Baker Day was to be the next day.

As before, we were all up early, but this time most of us considered ourselves veterans in this atomic test business and sat around quite casually reading and chatting and waiting for the word to take our positions for the explosion. At 0825 the ten-minute word was passed and we all selected a point from which to watch the explosion. At exactly 0835 the entire Bikini Lagoon seemed to erupt and rise into the air. Almost immediately our ship shook violently and we heard a loud, sharp crack as the sound of the explosion reached the ship. We were just about ten miles away and it seemed like we were right in the middle of things.

After the explosion first occurred, it looked like a huge ball of water, steam and smoke was rising right into the sky. Quite suddenly the smoke and steam disappeared and then you could see very plainly the predicted column of water rising right out of the sea. The top of the column after it arose took the usual mushroom shape and we learned later that the column was 2100 feet wide and about 5500 feet high. All in all, about a million tons of water were lifted out of the sea. After a short time the water began spilling back into the lagoon and the entire target area became shrouded in smoke and steam. It was some time before we could see any of the ships.

After the mist cleared, most of the ships seemed to be in the area. We learned later that the *USS Arkansas* and two small ships had been sunk almost immediately. The *USS Saratoga* and the Japanese *Nagato* were listing and the *USS Saratoga* finally sank late that afternoon and the *Nagato* on July 31st. On July 28th we got into the lagoon for the first time and were quickly sailed around the ships. The ships and the water were still radioactive, however, and it was impossible for us to board any of the ships. That afternoon we had a brief analysis of what they knew to date and Admiral Blandy estimated that it would be three weeks before we would be able to go aboard any of the target ships.

At 2130 it was announced that a group of us could fly home the next day if we wanted to. Immediately there was a mad scramble and frantic packing and I learned that I was to be one of the group who could fly. We took off the next morning and after an uneventful but very tiring trip arrived in Washington on August 1st.

It would be impossible for me to try to assess the value of the atomic bomb or to guess at any changes in military or naval strategy that may result from it. Such questions can only be answered after a careful analysis by many scientists, and experts of the Army and Navy. I did come away from these tests, however, with the distinct impression that I had witnessed a scene of tremendous power which is inconceivable; a destructive force which cannot help but modify some phases of military thinking throughout the world.

WAR MOBILIZATION

(Continued from page 20)

with each other. The Chemical Warfare Service might be well advised to look into this situation with the idea in mind of coordinating the supply and development of the Army's chemical requirements.

This association cannot afford to be uncomprehending of the importance of industrial mobilization nor to fail in a diligent and vigorous search for the key to the solution. Your future is the reward.

My personal thanks and I am sure the sincere appreciation of the members of this association go to the members of my committee who gave their valuable time to assist in drawing up this proposed statement of policy for the Chemical Warfare Association. These men are: Mr. Warren Watson, Mr. Lawrence Brown, Major General William N. Porter, Mr. George Taylor, Mr. Richard Turk, Mr. Samuel Weiss, and Mr. George Perkins.

BIOLOGICAL WARFARE

(Continued from page 26)

duction of disease organisms into a civilian or military population may be found in the chronicles of armies defeated, not by their human enemies, but by typhus fever, yellow fever, malaria, dysentery; it may be inferred from the terrible decimation of Napoleon's armies in Russia by typhus, from DeLessup's tragic failure in Panama because of yellow fever, and from the bitter experience of the American forces during the Spanish-American War.

It is true that bacteriological warfare had been banned by the Convention in Geneva—this same Convention had also banned the use of poison gas and of incendiaries, but the United Nations were obligated to prepare offensive and defensive measures for poison gas, and they were forced to retaliate to the use of incendiary bombs. The type of enemy who would construct a Buchenwald or a Dachau, or who would carry out the infamous Death March of Bataan, could not be relied on to observe rules made by previous governments a decade earlier. That this estimate of the enemy was only too true is shown by a translation from a captured Japanese document which stated that, "the agreement of the League of Nations against the use of bacteria in warfare has no power."

Post-war intelligence reports show that both Germany and Japan were aware of the possibility of biological warfare and had labored to perfect it as an offensive weapon. Japan, in fact, spent considerable work and ingenuity on this subject from 1936 to 1945 and had made material progress.

The fact that biological warfare has not been used, beyond limited attempts at sabotage during 1915-1918, makes it extremely difficult to evaluate it or even to compare it with other weapons. In some ways, biological warfare is similar to chemical warfare. For many agents it is desirable to set up aerosols comparable to the gases and smokes, but the techniques of doing this, and the protective mechanisms by which we would strive to protect our own forces, are often different from the methods of chemical warfare. Biological agents may be used for harassing purposes, and they may be persistent or non-persistent; in these qualities biological agents are again similar to chemical agents.

The radioactive gases from the atomic bomb, and their possible use as a weapon, have certain relationships in common with biological warfare. Both of these have physiological effects on living organisms, and these effects are often delayed for days or even weeks before becoming manifest. There is, too, a psychological factor which may be of considerable importance in the use of either biological or radioactive warfare. This factor is virtually impossible to assess, and would doubtlessly be conditioned by concomitant propaganda efforts and the susceptibility of the population to this propaganda.

For the most part, however, biological warfare stands as a new technique, and objective measurements in terms of casualties per pound of bomb or other such yardsticks are not yet available. Similarly, definitive concepts of biological warfare in tactical and strategical situations, and the relationships of biological warfare to other component parts of the military arsenal, are not to be had.

One of the salient features of biological warfare is that it need not be a weapon of total destruction. Rather, it is a weapon which is highly specific and adaptable. Unlike explosive and incendiary weapons, which attack both animate and inanimate objects alike, biological warfare is effective only against living things. This specificity for living things can be carried even further, and one could choose agents which will attack only certain food crops, or only domestic animals. Finally, of course, it is possible to employ agents active against man.

Even when used against man there is opportunity to choose the agent to suit the need. It might be desired to cause high mortality among a population, or again it might be deemed sufficient to cause only a high degree of incapacitation from which all, or very nearly all, of the casualties would recover with no lasting ill effects. Theoretically, either of these, or a host of intermediate degrees, could be accomplished.

Most often the thought which accomplishes biological warfare is that of widespread epidemics, decimating entire cities and towns. It is true that this may be one phase of biological warfare, but certainly not the only one. It is just as feasible to use non-epidemic agents, and thus only the persons originally exposed would be endangered. This situation is quite similar to a gas attack; furthermore, it is equally subject to protective measures such as the use of masks and proper clothing.

At the present time, when the attention of a good part of the world is directed toward finding a means of limiting the use of the atomic bomb and effecting some sort of international control over it, it is of interest to consider biological warfare from this standpoint.

First, it must be noted that biological warfare weapons can be developed and manufactured at a fraction of the cost of atomic weapons. The raw materials are not concentrated in the form of

(Continued on page 64)

GENERAL FRIES

(Continued from page 12)

separate force, research, to get this range, and accuracy was started. After three years labor and against advice, criticism, and even derision, coupled with threats of cutting off appropriations for that purpose, the Mortar was successfully rifled. Even then the struggle to maintain the Gas Regiment and its use of this 4.2 Chemical Mortar proved a terrible problem. Once the Mortar was entirely taken away from Chemical troops.

Under the recent Chief, Major General William N. Porter, the Mortar was restored to the Gas Regiment. Slowly but surely, and particularly in the Italian campaign, this Mortar proved its worth. From there on in Europe and in the Pacific its worth grew in appreciation so rapidly that as the war was drawing toward a close, the Navy and Marine Corps as well as the Chemical Warfare Service, were working with utmost speed to build up battalions and to train men to fire these Mortars. They proved to be the only gun that could fire from the LST and other landing craft successfully against the Japs in taking various islands in the Pacific.

The incendiary bomb that became such a power when used by the Air Service both in Europe and the Pacific, has been the development of the Chemical Warfare Service in connection with civilian agencies. Its entire manufacture has been under the Chemical Warfare Service throughout the war.

Then there was the development of the Flame Thrower. Useless in World War I, it became invaluable in the changed conditions, especially in the warfare in the islands of the Pacific against the Japs. One outstanding development was that of the Flame Throwing tank developed under Col. George F. Unmacht, Chemical Warfare Service in the Pacific. This development produced the unheard-of range of some 525 feet for flame with the gasoline jell developed by Chemical Warfare Service research. Later to reach the enemy entrenched on hillsides beyond the range of 500 yards where the tanks could get, an additional 500 feet was obtained through the use of a hose connecting the tanks with the Flame Thrower.

The development and use of these three weapons by skilled and brave crews of the Chemical Warfare Service troops alone should make the Chemical Warfare Service immortal.

Phosphorus was not only a casualty producing agent but one of the best smoke screen agents, certainly for use in shells. Research into poisonous gases is proving of value to medicine and just now there is being given to the public some of the details of research into nitrogen and other forms of mustard gas than the Dichlor-Ethyl-Suphide type.

The great traditions of the Service should make the successful development of a Chemical Warfare Association a foregone conclusion. The success of the Service, born, as has been said in the midst of war, four thousand miles from home, has been such as to make *all* Americans, as well as those of the Chemical Warfare Service, proud of the Service.

The Chemical Warfare Association should make, in my opinion, its greatest efforts along the line of keeping alive in the Chemical Warfare Service what I call the "soul of research." The "soul of research" is the willingness to examine into every suggestion for new things that may be made; assigning, however, to each suggestion a percentage of probable value based on prior knowledge of the subject and its relation to other matters.

Whenever there is found a real military need, or in fact a civilian need of a certain product, weapon, or peace material, nothing should deter the most searching efforts being made to successfully solve the problem.

There will always be doubting Thomases and those who will always say "it can't be done," but if the result to be attained is worth the effort the history of invention and development proves that many things that looked impossible at first are eventually worked out successfully. And lastly the Association should always keep in mind the first axiom used by the Chemical Warfare Service in France in World War I while trying to adapt the material at hand to the needs of the occasion: "if it won't work—make it work."

AMOS A. FRIES, *Maj. Gen., Ret.*
Formerly Chief, Chemical Warfare Service

CWS RESEARCH

(Continued from page 18)

develop from the research which is in progress or under consideration. It will not be hidden if it lacks military importance.

In order to maintain close liaison with industry and educational institutions, so that CWS may secure the best information and so that the research may be of highest quality, the policy has been adopted of placing research contracts with such agencies. The contracts call for work in a particular field, but the methods of directing and performing the work is left largely in the hands of the organization doing the work. A substantial portion of CWS's funds for research and development will be used to finance this program. Some contracts have been let and others are being negotiated.

The Secretary's Corner

By JOSEPH SCHWIMER, *Capt., Cml. Res.*
Secretary-Treasurer

I have completed four months of service to the Chemical Warfare Association in my capacity as secretary-treasurer as of this first issue of the *Chemical Corps Journal.* From January through May 1946 I had the distinct pleasure of working with Herbert K. Bear, Col., Cml. Res., provisional president, in the organization of the Association.

Capt. Joseph Schwimer, Cml. Res.
Secretary-Treasurer

Born in Stamford, Conn., May 11, 1908, Captain Schwimer attended the public schools and graduated from Stamford High School in 1924. After spending two years in bookkeeping and clerical capacities, he took up golf as a profession and taught for several years until he entered the newspaper business. Joe became Chief of the Waterbury Bureau, Sunday Herald, until he enlisted on 31 October 1942. From 1939 through 1941 he served as Judge of the Municipal Court, Town of Trumbull, Conn. He was widely known for his uncanny political predictions in Connecticut. After three months in the Air Corps at Miami Beach, Capt. Schwimer went to OCS at Edgewood Arsenal. He graduated on 1 May 1943 and was commissioned a second lieutenant. He was assigned to the Chicago Procurement District as Public Relations Officer. On 1 April 1945 he was assigned as Assistant Chief, Information Branch. He served as Chief, Information Branch, until 7 June 1946. Capt. Schwimer was awarded the Army Commendation Ribbon and many letters of commendation for his public and industrial relations work. He lives in Mt. Rainier, Md.

I put my foot into places where I, perhaps, should not have trod. There were times when I spoke out of turn and was spanked for it—and I was ready to toss in the towel and go back writing politics, or setting up my own industrial and public relations offices. But there always seemed to be a bright spot hovering over the horizon and I would return to headquarters determined to see the organizational work through. Today, I feel proud to work with men who have no selfish interests. We are all working toward our objective, national defense—preparedness, research and development, and a modern mobilization planning program.

My task was to assist in organization of chapters, obtain group memberships and solicit advertising. None of the officers of the association draw one cent for salaries. We wanted no elaborate offices. We feel that the local chapters are the grass-roots of the association, and that funds should be allocated locally for expansion. Our job here is to keep the chapters and members informed as to their objectives, and to receive constructive criticism so that we may charter our future course. We want the funds available to promote expansion, scholarships, research and development and mobilization planning. We have the officers and directors and directors-at-large who can help us, but at the same time we must conserve our assets to spend when these programs have been set up and ready to function.

There were many disappointments in my trips around the country. I found many men, big and small, who could not, or would not join with us to help out in our program. I could tell some fantastic stories about some citizens who had no interest in promoting national defense through our association. When I heard them, I was more than determined to stick to the guns.

I have talked to many men, officials of big industry, officials of small industry, soldiers, civilians. Some wanted to wait and see how we do in our first year before joining—others joined enthusiastically. Many wanted to keep in touch with the Chemical Corps and the soldiers they associated with during the war; others wanted to help us out financially.

"What do we get out of it?" was a common question. Industry was swell. They wanted to help, not because of the business contacts during the war, but to help with our future plans. They believe in research and development and war mobilization planning. We had nothing to offer but a program, but they saw that we did have something that was of interest to every American and to industry.

Let me tell you what the President of a large corporation said: "You can have a blank check if you can, through the Association, convince industry and the American people that we must have the biggest and best preparedness program in the world. You tell me what you want now and you'll get it in the next mail." Sure, we need financial assistance, but we want to give something in return and that is why the Executive Committee decided to run advertising in the magazine. We want the magazine to pay its own way. But to know that we have someone ready with a blank check convinced me that we are on our way to top all other associations. We're progressive, and we have enough men in the field to keep us progressive.

The assistance I received in the field was most enthusiastic. To all I give my sincere thanks. It was impossible to see everyone, but those I did visit were very pleasant.

Our success is dependent upon the amount of effort put into the Association by our officers, directors and, above all, local chapters and the individual member. The prospects of triple-headers on Christmas Day in the baseball leagues if the 168-game schedule is adopted frightened the ball players, and possibly might have contributed to the stock market retreat. I don't think that any member, be it soldier or civilian or industrialist, need fear the schedule of our association. Sure, we have plenty of work ahead, but we're not a year old yet and we've scaled many of the obstacles normally blockading progress of a new organization.

Our Executive Committee has met on an average of two and three times a month during the summer, and don't think for one minute that we didn't have some "hot" sessions. There were many wrinkles to be ironed out. We had friendly arguments, but I never found any dissension following the majority vote on a question. We've been elected for one year, and our President has reiterated his statement that it is his policy to have the Association operating flawlessly so that his successor will not have to run to the medicine chest for aspirin.

I don't think I have touched all the bases with this brief account of my experiences, but those whom I missed know that I've acknowledged my appreciation for their help in one way or another.

In 1947 we hope to be the most progressive of all associations. We are receiving considerable cooperation from the other military associations and I express our sincere appreciation to them.

My job this fall and winter is to increase the memberships, obtain advertising for the *Journal*, run the office, organize chapters, follow the edicts of the Executive Committee, assist the editor of the News and the *Journal*, be a John J. Anthony and start formulating plans for the 1947 meeting of the Association. All suggestions are welcome.

We are happy to announce that our membership list is almost up to the 3,000 mark. This includes the regular members nominated by industry under the group membership plan. Our goal by 1 January 1947 is 5,000 paid-up members.

I hope you will all dust off the welcome mat for me in the months ahead so that we may keep the good name of the Chemical Corps in the foreground.

With every season's greetings, I remain,

YOUR SECRETARY.

The Executive Committee

Since the first annual meeting the Executive Committee has met at least twice a month in Washington, mapping out future operations of the Association and attending to current activities.

Fully cognizant of the fact that local chapters must have material in order to have sufficient reasons to call meetings, the committee began working on various types of programs. Our President, Ludlow King, was in constant touch with the War Department and with the Chief, Chemical Corps, meeting regularly with representatives of other military associations and searching for the material which would be of interest to the chapters.

The results of almost continuous contact are bearing fruit. Mr. King and members of the committee have decided that the Association must concentrate on research and development and mobilization planning, and that close liaison must be maintained between the Association, the War Department and the Office of the Chief, Chemical Corps.

In all, your committee has been functioning at top speed. Finances, salaries, publications, office routine, editorial policies, advertising, public relations activities, coordination with other military associations, membership drives and many other important phases of organization have been thoroughly thrashed out at the meetings.

Meetings were held at the Press Club and the American Chemical Society offices. Mr. King has met with other association representatives, the Undersecretary of War, and top ranking Army officers in an effort to carve out our future.

At this writing your committee feels that we are progressing to the point where important decisions will have to be made very soon. Every member will be kept informed as to the nature of the developments—which are developing rapidly.

Your committee is much concerned with the expansion of the research and development division of the War Department and with the mobilization planning of the Chemical Corps. These angles have our constant attention, but it takes time to obtain the correct information. We will not publish anything unless it is 100 per cent correct.

The meetings have been most interesting. Disagreements have arisen. They were soundly thrashed out and the majority vote decided the issues.

Your committee now is of the opinion that with the first issue of the *Journal* the Association is soundly established. It is yours to have and to hold.

History of the Edgewood Chapter

By MAJOR GEORGE DANALD, *CC*

FOR YEARS people in and interested in the Chemical Warfare Service have debated at bull sessions all over the country the desirability of an association such as some other services have. While the overwhelming majority of opinions were wholeheartedly in favor of such an organization, no one had the initiative, enthusiasm, know-how, and opportunity all at the same time to do anything concrete about it. With such a "grass roots" feeling throughout the many thousands who were in our service, however, it was inevitable that someone someday would take the first definite step that would mark the organized beginning of a Chemical Warfare Association.

Upon Colonel Herbert K. Bear devolved this distinction. In conversations with Major General Alden H. Waitt the national association was born. Not long after the incorporation of the Chemical Warfare Association on 6 February 1946, an informal meeting was held by Colonel Bear in Building 1 at Edgewood Arsenal with a few interested people from all organizations on the Post. They laid the groundwork for the first meeting of the Edgewood Chapter-to-be.

A significant augury for the future was the highly successful first annual meeting of the Edgewood Chapter, Chemical Warfare Association, which was held 20 March 1946 in Post Theathre No. 1. About 200 interested and enthusiastic people heard Major General Waitt, Brigadier General Avery, Colonel Bear, Colonel Garcin, Colonel Hamilton and Colonel Spraker address the meeting on the aims and modus operandi of the association in general, and a local chapter in particular. This was followed by balloting for chapter officers, which resulted in Colonel Harry W. Spraker becoming President of the Edgewood Chapter, Mr. Harry Knight and Mr. Roy Kulp were chosen First and Second Vice Presidents, with Mr. Edmund H. Schwanke as Secretary-Treasurer. Lt. Colonel Drennon, Mr. Henry Fischer and Mr. Brooks Crawford were selected as Directors.

Colonel Herbert K. Bear, President of the National Chemical Warfare Association, speaks to group of members and guests assembled at Post Theater for first meeting of the Edgewood Chapter.

Only a few days later the secretary was able to log 294 official paid-up charter members.

Now commenced the anonymous drudgery of organizing committees, setting up books and records, planning for the future and caring for the growing pains that all new and important organizations inevitably experience. Besides the Chapter officers, Lt. Colonel Lloyd Schrader, Assistant Post Executive Officer, labored far "above and beyond the call of duty" to lay a solid foundation for the organization. The officers met on the 3rd of April and selected committees for Education, Publication and Technical Developments; Constitution, By-Laws, Organization and Policy; and Finance and Membership, as well as a Special Convention Committee to handle the already projected annual national meeting.

The efforts of these committees soon began to appear in the form of gratifying results. Mr. Knight as Chairman of Constitution, By-Laws, Organization and Policy Committee was able to present the first draft of the Chapter's Constitution and By-Laws early in May. President Spraker transmitted it to National on 13 May 1946, who returned it approved in due time.

The Finance and Membership Committee reported on the day before the National meeting that membership had already risen to 326, an increase of 32 charter members. By the end of August this had further risen to 358, which demonstrates the kind of steady gain that makes for strength in such a professional society. A noteworthy membership was issued 19 June 1946 when Secretary Schwanke presented a Charter Membership Card to M/Sgt. John Kaiser, CWS, a member of the First Gas and Flame Unit and one of the oldest persons in CWS in point of service.

The work of the Special Convention Committee requires no formal report. The 500-odd people who attended the First National Encampment at Edgewood Arsenal on 24 and 25 May 1946 enthusiastically attested the excellence of all the arrangements made for that thoroughly successful gathering. This was the first major project

undertaken by the Edgewood Chapter. Despite the newness of the organization it discharged its duties as host to the Association so well that it won universal praise from its guests.

Major Edmund H. Schwanke, Cml. Res.
Secretary, Edgewood Arsenal Chapter

To illustrate the thoroughness with which even small details were cared for reference may be made to a letter from the Washington Chapter President to the Edgewood Chapter President. He thanked the local chapter for arranging to stop Pennsylvania trains at Edgewood for Encampment visitors but felt they might have gone too far in thereafter stopping all railroad trains in the country just so the guests could sleep well at night! Possibly the railroad strike which began on 24 May was a factor.

It was at this memorable gathering that Colonel Bear presented President Spraker with the Edgewood Arsenal Chapter's charter. Fittingly, Colonel Spraker has had a frame made for it of wood from an ancient walnut which was cut down 'way back when the old Neck Road was being connected at the "Flatiron" with Magnolia Road. Such a venerable landmark having weathered all manner of storms serves fittingly as a frame for the charter of an organization whose future will doubtless survive through a great many long years.

Chemical Warfare demonstration at first annual meeting

THE INDUSTRIAL RUBBER GOODS COMPANY

ST. JOSEPH, MICHIGAN

Manufacturing Specialists
of Molded and Extruded
Mechanical Rubber Goods

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ST. JOSEPH, MICHIGAN

Doin's At Detrick

By A. E. (TED) HAYWARD

SEEMS to me like local news from chapters gets a little dull in spots, and this sure isn't gonna be any different and I told the boss I didn't wanta sign my name to this, but he says I gotta. That's that. Matter of fact, if I was gettin' paid for this I'd resign, but seems I got elected (*syn. railroaded*) into this and every time I come in with that to-hell-with-it-I'm-gonna-quit look in my eye everybody starts a real spritely discussion on how's my golf game. That is such a sore subject I get mad and off the track and stomp out without gettin' my business done.

Well, Col. Bear came over to Detrick on 7 May and handed us a Charter and everybody was real proud and we spent the rest of the day signing the thing and admiring how pretty our names looked on such an imposing thing as that Charter. One of the boys finally got his head in the game long enough to suggest that we oughta have some officers duly elected to go with that "legal instrument," as he called it, so we did. We got Dr. John Schwab for president, and Mr. Nelson Lyttle and Dr. Frank Olson for first and second vice presidents in that order, and Mr. Ted Hayward for secretary-treasurer. And I'll add right now that that job is all secretary and no treasurer—the only money I've seen is checks that pass through my hands on the way to Joe Schwimer or Don Rogers and when I mention money in chapter meeting all I do is get tabled till the next meeting.

We got some good committees, too, and Dr. "Archie" Gorelick is building up our membership —got 58 now—and he's got lots of good help on that committee, too. Then there's Dr. "Norb" Fell going great guns lining up some first-class speakers for our fall and winter programs, and Doc Wedum getting real serious and doing some fine work on the War Mobilization Committee. We'll hear more of that as time goes by. That should have been all the committees, but one day I was sittin' in meeting and didn't have sense enough to keep my big mouth shut and so now we got a publicity committee. That didn't seem so bad—just a little piece in the paper once in a while, but now they tell me we're gonna put out a chapter bulletin in the near future. The "future" part is O. K., but I sure don't like the way they stressed that "near" part—sounded like they was talkin' about no later than tomorrow evenin' and possibly not that long. I talked things over with my secretary, and she says she guessed she could get it out by the middle of Septober, so mebbe the bulletin'll be in the mail around then. Anyway, we are puttin' one out and we'll try to get all the chapters on the mailing list—but don't hold your breath 'til you get it—that secretary's pretty busy right now.

We had a right fine meeting on the 28th of August, with Pete King and Hal Rodier up here to tell us about the CWA (or the CCA or just whatever we're changed to now) and they sure did a bang-up job of gettin' us told all about it and arousin' lots of interest among the members. The chapter enjoyed it so much, in fact, that they voted to buy them lunch next time if they would come back again. I thought that was mighty fine, myself.

That's almost all, but before quittin' I wanta mention the fine work that Dr. Ed Hill did in the early organization of our Chapter—he worked hard and did a swell job and if anybody's name gets put in here his sure should.

So long 'til next time—good luck and *get more members!*

Dr. John L. Schwab, President, Camp Detrick Chapter

DR. JOHN L. SCHWAB

President of the Camp Detrick Chapter, Dr. Schwab is originally from Kansas. He received the B.A. degree from Kansas State Teachers' College and went from there to Ohio State University. The latter institution granted him the Ph.D. degree in 1942.

Also in 1942 he entered on active duty in the Army. Most of this duty was in Special Projects Division of Chemical Warfare Service, and Major Schwab was well known at Camp Detrick and other allied installations.

Dr. Schwab is continuing his work at Camp Detrick in a civilian capacity, and he and his family have now made their home in Frederick.

MR. A. E. HAYWARD

Secretary-Treasurer of the Camp Detrick Chapter, Mr. Hayward calls Texas home. He received the M.A. degree from the University of Texas in 1942 and then spent a year on the faculty there.

In June, 1943, he entered on active duty and was ordered to Camp Detrick in November of that year. The period from November, 1943, to May, 1946, was spent in Special Projects Division, CWS.

Mr. Hayward is still at Camp Detrick in a civilian job and will continue in his work there.

A. E. "Ted" Hayward
Associate Editor

CHAPTER NEWS

ATLANTA CHAPTER

By FRED BELLINGER, *Lt. Col., Cml. Res.,*
and DR. HAROLD B. FRIEDMAN,
Maj., Cml. Res.

We're organizing the Atlanta, Ga., chapter. The big banquet-meeting was held 30 September 1946, and we had representatives from six colleges and universities, ROTC units, and Third Army. National Headquarters was represented by Joseph Schwimer, Capt., Cml. Res., Secretary-Treasurer.

Many of our old friends were contacted and National Headquarters assisted by mailing letters about the big meeting to about 70 former contractors, who were thought would be interested in keeping in touch with the Chemical Corps through the Association and its National Defense program.

We'll give you the complete details in the January issue of the Chemical Corps Journal.

BALTIMORE CHAPTER

By EDWARD M. HOSHALL, *Col., Cml. Res.*
President, Baltimore Chapter

The Baltimore Chapter will begin activity with a bang-up meeting the latter part of September. During the summer months, all officers of the Chapter were transferred to other sections of the country and we are rounding up the members and friends for our first Fall session.

We counted on Col. Bruce Humphreyville to carry on with the membership drive, but he was sent out to the Johns-Manville Co. office in Chicago. We're going to miss Bruce as he was a good plugger. However, the Association can count on us to keep the ball rolling through newspaper publicity and personal contact with the friends of the Chemical Corps.

BOSTON CHAPTER

While many former members of the Chemical Corps had joined the Chemical Corps Association after the first appeal from Washington, it was not until the call went out in April that any effort was made to organize a Boston Chapter.

After some concerted effort the Boston Chapter, Chemical Corps Association, was officially organized and on May 14th the charter was presented by Colonel Herbert K. Bear, then provisional president of the National Association.

Local officers and directors who have been elected are: Carroll E. Adams, Col., Cml. C., Ret., President; Stanley Cheney, Col., Cml. Res., 1st Vice President; Maurice H. Wright, Col., Cml. Res., 2nd Vice President; Ellen L. Gaynor, Secretary-Treasurer. Directors: Frank L. Armitage, David Black, Roy C. Charron, Earl Watson and Philip E. Young.

Since the last meeting the above named have held a meeting to plan on the number of meetings to be held in a year, the writing of the constitution (which has now been sent out to all members for their approval), the number of committees, etc.

At the present time the Boston Chapter has a membership of sixty-six regular members and four group memberships. Boston Chapter is rather proud of its accomplishment in the line of membership, particularly since no membership committee has been appointed as yet.

While not much activity has taken place during the summer months because of vacation time, it is expected that after the approval of the constitution many activities will be started.

CHICAGO CHAPTER

By ELLIOTT MORRILL, *Lt. Col., AC Res.*
President, Chicago Chapter

Because of the coal strike, our first big organizational meeting last May had to be postponed. However, we set up temporary officers and canvassed the field for new members, secured new ideas, held informal meetings and are now ready for our big meeting at the Armed Forces Officers Club, 128 N. Wells, Chicago, on 30 September.

We organized a group in March and we now have 110 individual members and boast of seven industrial memberships. This is a potential of 250 individual members, but our goal is 500. Due to summer vacations and the fact that many of us had to get oriented to our positions in industry, as well as to form our own business, our activities slackened off. But we're now ready to throw our punches to make the Chicago Chapter the biggest and best in the country. We're going to elect permanent officers on 30 September.

I would like to express my appreciation to Harold L. Phillips, Capt., Cml. Reserve; John H. Seamans, Maj. Cml. Res., M. B. Chittich, Col. Cml. Res., Max Woldenberg, Lt. Col. Cml. Res.,

Pres Heller, Col., AC, Rec., Nicholas Fritz, Maj., Cml. Res., and all those who assisted me in early planning.

Here in Chicago, we have the nucleus of an interesting chapter. You'll hear from us soon—but loud. We wish the Association success. We're behind it.

DUGWAY CHAPTER

By T/5 ANTHONY R. LEO
Secretary-Treasurer, Dugway Chapter

We have been holding regular monthly meetings at Dugway, and in developing a feeling of unity and comradeship among the members sponsored a picnic for members and guests on June 3. Only recently, August 20, the Chapter sponsored a demonstration and lecture on the 4.2 chemical mortar. This program was directed by Theodore H. Paulson, Chief, Weapons Development Branch, Dugway-Deseret Command. It was an extremely interesting program. A large crowd attended.

At our monthly meetings we were busy electing officers, recruiting new members and adopting the constitution and by-laws of our Chapter. Until our military and civilian personnel attains a more stable condition, our membership will be constantly fluctuating, but we are sure this condition will be remedied with time and the Chapter will go forward on a firm, interesting and productive front. You'll be hearing more from us out here very soon. The following officers, board of directors and committees were elected at an early meeting: Dr. James L. Wilding, President; Major Luman Ney, 1st Vice President; Sgt. Joseph Huscher, 2nd Vice President; T/5 Anthony R. Leo, Secretary-Treasurer.

Board of Directors: Jesse Cannon, Salt Lake City; Lt. Col. Sam Efnor, Jr., William Thompson. Membership Committee: Capt. Laurence Remick, Sgt. Joseph Huscher, T/5 Anthony R. Leo, Howard Lanier.

By-Laws Committee: Maj. William Wallace, Lt. Claude Trapp, Lt. Col. Sam Efnor, Jr., William Thompson, Dr. James L. Wilding.

Publications Committee: T/5 Douglas Brooks, Lt. Claude Trapp, Lt. Peter Ballinger. Director-at-Large: Maj. Luman Ney. Area Representative: Dr. P. A. Leighton, Dean of Science Schools, Stanford University, Palo Alto, California.

HAWAIIAN CHAPTER

The Hawaiian Chapter, Oahu, of the Chemical Warfare Association was organized and chartered within a week after Col. George F. Unmacht, Oahu, Chemical Warfare Service, USAFMIDPAC, APO 958, received word that the Association was under way.

Col. Unmacht was elected Honorary President of the Chapter; Edouard R. L. Doty, Col. Cml. Res., President; Ronald Q. Smith, 1st Vice President; Maj. Vincent J. Kosebutzki, 2nd Vice President, and Capt. Eugene E. Monk, Secretary-Treasurer.

The Chapter now boasts of 13 charter members and has met frequently since the first annual meeting at Edgewood Arsenal. The constitution and by-laws were adopted as presented by national headquarters.

Although the Chapter was unable to furnish news or information concerning its activities and membership in the current issue of the *Journal*, Col. Unmacht is working on a good yarn for the January issue.

"We send our greetings to all our friends throughout the nation," wrote Mr. Doty, who is back at his job as assistant manager of the Merchandise Dept., Alexander & Baldwin, Ltd., 822 Bishop St., Honolulu 1, Hawaii.

HUNTSVILLE ARSENAL-GULF DEPOT CHAPTER

By EDNA B. WIGGINS, *Secretary-Treasurer*

Huntsville Arsenal is all set and raring to go. We've got our officers and 30-odd members, but watch this number grow.

We hope to have important fall and winter meetings and we'll be more than glad to receive and exchange ideas with national headquarters and other local chapters.

Our officers, elected 21 August 1946, are: Capt. Walter T. Harper, Jr., President; Wilbur S. Davis, Procurement Division, Vice President; Mrs. Edna B. Wiggins, Employee Relations Section, Secretary-Treasurer.

You know that Col. S. E. Whitesides, Jr., is our Commanding Officer, and he is supporting us with all at his command. We also welcome Major William A. Cowne to our Engineering Service Division, and know he will take an active part in our expansion program.

We're going after two new members for every member and at our next monthly meeting we expect to make arrangements to sponsor a dance or some other social function to attract a crowd. At our next meeting we will set up our committees and will definitely work on getting forwarding addresses of those members who leave this post for other parts.

NEW YORK CHAPTER

By CHARLES H. MINOR
President, New York Chapter

The New York Chapter, which should be the largest of all the Association chapters, is pre-

paring for its fall and winter schedule. With many of our members tied up with job orientation, vacations and divers reasons, we didn't do the work we expected to do. But we're going to make our meetings worthwhile and attract new members.

Col. Morris Black, Commanding Officer, New York Procurement District, has been most cooperative, and we heard about the national organization's secretary-treasurer beating a path around New York signing up new members and obtaining the necessary advertising for the *Journal*. With that sort of cooperation, we're going places.

We were most fortunate in obtaining fine officers. They are: Charles H. Minor, President; S. Willard Jacobs, Vice President; Jerome F. McGinty, Secretary, and Marvin J. Silberman, Treasurer. Mr. Jacobs is also a member of the Chemical Corps Advisory Board, so we have the benefit of his good counsel in our chapter.

When the wheels start churning, the New York Chapter will set the pace. Any of the officers will be glad to hear from our old friends when they are in New York. A call to Col. Black will steer you to the right door.

PINE BLUFF ARSENAL CHAPTER

By WALTER J. MAYS
Sec'y-Treasurer, Pine Bluff Arsenal Chapter

We are now in the process of scheduling our Fall and Winter meetings, and assure National Headquarters of continuous activity. Our hands have been very full out here, but we're just as anxious as the other chapters to get into full swing.

Our Chapter President is Captain C. E. Ross; Vice President, T. S. Dewoody; Secretary-Treasurer, Walter J. Mays.

We have 30-odd members, but are pushing a membership drive to follow the National slogan: "A new member for every member."

I was very pleased with the first annual meeting at Edgewood Arsenal last May, and know that the National Association needs our support. We pledge that to our National officers.

ROCHESTER CHAPTER

By ELWOOD H. SNIDER, *Col., Cml. Res.*
Sec'y-Treasurer, Rochester, N. Y., Chapter

The Rochester Chapter got off to a good start last May, and have held two formal meetings since. In August, we held a get-acquainted picnic. We have 12 members to date with several more potentials. The newspapers have given us wide publicity and we are going ahead with a full program of eight monthly meetings for the winter, with seven speakers on tap. The subjects of the speakers are such that the local reserve office will authorize credit hours.

Officers for 1946 are: C. W. Crowell, Col., Cml. Res., President; Webster C. Fisher, Maj., Cml. Res., Vice President; Ellwood H. Snider, Col., Cml. Res., Secretary-Treasurer; Ellwood H. Snider and J. E. Ollson, Lt. Col., Cml. Res., membership committee. We will hold a meeting in January for election of officers for 1947.

With a meeting scheduled for each month, with the exception of December, the following speakers were announced: Lt. Col. Ingalls Bradley, Cml. Res., Lt. Col. Tarkington, AC, Res., Dr. Albert E. Noyes, Webster C. Fisher, Maj., Cml. Res.; Harold H. Wright, Capt., Cml. Res.; Dr. Edwin C. Wiig, and Edward Lowthian, Maj., Cml. Res. Meeting place is 61 Orchard Park Boulevard. Meeting dates are: Sept. 25, Oct. 23, Nov. 27, 1946, and Jan. 29, Feb. 27, March 27, April 30 and May 30, 1947.

We're on our toes and know a profitable program is set up. We're ready for anything from National Headquarters.

SAN FRANCISCO CHAPTER

By PHILIP J. FITZGERALD, *Lt. Col., Cml. Res.*
President, San Francisco Chapter

The San Francisco Chapter was formed on 20 Feb 1946, and has been a live-wire unit since then. We held a family dinner-meeting and had as our speaker, Maj. Gen. David Prescott Barrows, President emeritus of the University of California. Naturally, our particular interest was in CWS and its mission in the defense program of our country. We feel this session was an important one, and out of it came our Chapter officers and committees as follows:

Philip J. Fitzgerald, Lt. Col., Cml. Res., President; Frank M. House, Col., Cml. Res., Vice President; W. P. F. Brawner, Col., Cml. Res., 2nd Vice President; Burton D. Willis, Lt. Col., Cml., C., Secretary; C. L. Lambert, Treasurer; Mrs. Grace C. Barbee, Recording Secretary; Col. J. W. Lyon, Col. Edwin C. Maling, Lt. Col. E. M. Prince and Lt. Col. L. A. Nichols, Board of Directors.

Sections: Procurement, Arsenals (Mfg.), Lt. Col. Prince; Depots Operations, Lt. Col. Nichols; Technical (Edgewood, Dugway, Medical-Edgewood) Col. Lyon; Inspection, Capt. Jack Norton; Operations and Training (men in the Field, Battalion, Air Chemical, Base Depots, Smoke Companies, Impregnating, Decontaminating, Field Laboratories, Intelligence Teams), Col. Maling, Lt. Col. Willis and Lt. Col. E. F. Hockenbeamer; Central Administration (OCCC) Lt. Col. Fitz-

gerald, and Industrial Liaison, Col. Brawner.

Further meetings were postponed during the summer period to give the various officers and committees an opportunity to make their plans for a schedule to commence in the fall. Names of those residing in this area, who served with CWS in the past, are being ascertained by the membership committee. They are being contacted and are responding in a gratifying manner—new members are being signed up every week. The success of our Chapter is assured. Our membership goal—the century mark—should be reached by the first of the year.

We send our sincere greetings to all the chapters and look forward to an interesting program from headquarters.

WASHINGTON (D. C.) CHAPTER

By MILLARD F. PEAKE, *Col., Cml. Res.*
President, Washington Chapter

The Washington Chapter, Chemical Warfare Association, was organized at a meeting in Building T-7 on 20 February 1946, after Maj. Gen. Alden H. Waitt, Chief, Chemical Corps, expressed his interest in the formation of the Association. Maj. Charles E. Pledger, General Counsel of the national organization, explained the aims and purposes.

More than 100 members were signed up at the initial session. The nominating committee, composed of George O. Gillingham, Lt. Col., Cml. Res.; Maj. O. L. Varella, and Morris Guggenheim, Lt. Col., Cml. Res., presented the slate of officers and the following were elected: Millard F. Peake, Col., Cml. Res., President; A. W. Jacobs, 1st Vice President; John W. Stockett, Maj., Cml. Res., 2nd Vice President; Wayne W. Fort, Maj., Cml. Res., Secretary-Treasurer. Directors: Charles E. Pledger, Jr., Maj., Cml. Res.; Richard E. Redfield, Maj., AG; Capt. Alice M. O'Meara; Robert E. Porter, Capt., Cml. Res.; Robert M. Oremland, Capt., Cml. Res.; Lt. Edgar A. Crumb, Miss Ruth LaFoy and George E. Raymond.

Due to the decentralization plans of the OCCC, many of our members transferred to other chapters, but we are preparing for a fall and winter membership campaign. We intend to have an early meeting and await a complete list of members from national headquarters before mailing out notices. We ask our members to bear with us.

ROCKY MOUNTAIN CHAPTER ELECTS OFFICERS

On 6 February 1946, through the initiative and efforts of the Commanding Officer, Rocky Mountain Arsenal proudly organized the first Chapter of the Chemical Warfare Association, now known as "Rocky Mountain Chapter No. 1, Chemical Warfare Association, Denver, Colo."

In order to expedite the organization and to create an active interest in the Association,

Colonel Charles S. Shadle, CC
C.O., Rocky Mountain Arsenal

Colonel C. S. Shadle appointed temporary officers as follows: Colonel John D. Tolman, President, and Lt. John P. Megaris, Secretary-Treasurer, who acted in their respective capacities to fulfill the mission of initial organization and to institute a membership campaign.

On 15 April 1946 Rocky Mountain Chapter No. 1 was honored by the visit of the Honorary President of the Association. A meeting of all members was called and General A. W. Waitt presented the Charter.

Election of officers was held on 13 May 1946, with the following results: J. P. O'Hehir, President; Ralph Miller, 1st Vice-President; Major W. B. Simeral, 2nd Vice-President; Mrs. Ruth Ashby, Secretary-Treasurer; and Col. John D. Tolman, Tech. Sgt. Frank B. Wells and James McLaughlin, Board of Directors.

At the next meeting, 17 May 1946, in accordance with the constitution and by-laws of the Association, the officers were assigned their duties. Various committees were appointed to create interest and increase membership in the organization.

To create additional interest, it was decided to move the Western Chemical Warfare School Museum to the Administration Building as a permanent museum and an Association meeting room.

Rocky Mountain Chapter No. 1 delegated four members as representatives to the National Convention, Edgewood Arsenal, Maryland, 24 and 25 May 1946.

On 25 August 1946 the first annual picnic of the Chapter was held, with excellent attendance of approximately 800 people.

The program consisted of a welcoming speech to the public by Colonel C. S. Shadle, a demonstration of Chemical Warfare material (smoke grenades, smoke generators, flame throwers and incendiary bombs), a picnic lunch and dancing to a real western orchestra. Everybody had a grand time and this first large-scale effort of the Chapter was an immense success.

The date of the picnic was decided upon as the closing date for the receipt of applications for charter membership. It is interesting to note that when the Chapter received its charter it consisted of 75 members, while at the closing of charter membership it had grown to 217 members.

Considerable planning is now being done towards the fall and winter season, with at least one "get-together" of all members each month at various activities, and with the publication of a local chapter news bulletin each month.

(MRS.) RUTH W. ASHBY,
Secretary-Treasurer

DALLAS CHAPTER

The Dallas Chapter, Chemical Warfare Association, will formally apply for its charter in October. The reason for the delay is that it was the wish of the officers that as many charter members as possible be maintained.

Two meetings were held, the first one convening on 25 June at Headquarters, Dallas Chemical Warfare Procurement District, where the following officers were elected: Roy A. Lamb, President; John E. Mitchell, Jr., Vice President; W. W. Taggart, Secretary-Treasurer; W. P. Stone, Membership Committee Chairman, and Albert Pranger, Program Chairman.

The second meeting was in the form of a luncheon on 22 July 1946 at the Stoneleigh Hotel, Dallas, for the purpose of reviewing plans regarding the Dallas Chapter and its future activities. At this meeting, it was decided to hold all future meetings in the form of a stag, preferably in the evenings, to permit more time for discussion and a general get-together. We will hold regular meetings beginning in October.

Mr. Pranger is arranging for top-flight speakers for each meeting, and our Chairman on Memberships is working to obtain new members. Mr. Stone is also working to start the nucleus of the CWA chapters in major cities within the 13 states under the DCWPD.

Our Vice President, Mr. Mitchell, Jr., was honored by being selected as a Director-at-Large of the National Association.

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SECRETARY PATTERSON

(Continued from page 10)

our plans kept them guessing. Hence, many Chemical Warfare Service activities did not capture the headlines, any more than does an alert fireman waiting for the gong.

Fortunately gas was not used. However, it was unfortunately the common impression, until late in the war, that the production and employment of gas munitions were the only major activities of the Chemical Warfare Service. In the War Department we were fully cognizant of the great scientific developments which were accomplished by members of Chemical Warfare Service working hand in hand with the National Defense Research Committee, with civilian scientists and with industry. Truly outstanding results were achieved in the development of artificial fog dispensers and smoke apparatus which shielded ships and men and supplies from enemy planes and guns in each of the major theaters of war. Highly effective chemical incendiary bombs rivaled the the demolition type in damage to the Reich, while in the Orient, sixty-six completely charred Nippon cities, as we have since learned, had the Japs on the ropes even before they were hit by the atomic bomb. In combat operations, the Chemical Mortar Battalions frequently saw as much service as did the Infantrymen they were supporting. When the Manhattan Project began to develop the atom bomb, we drew heavily on Chemical Warfare personnel for men trained in physical chemistry.

It is encouraging to the War Department to know that you will continue to direct your laboratory research and battlefield experience to further the defense of our country and to foster scientific and industrial research by making available to the nation's soldiers, industrialists and technicians the results of this work.

With the advent of the atomic bomb era upon which we are entering, it is hoped that the Chemical Warfare Service, because of the nature of its work and scientific training, will continue to keep abreast of developments in the atomic and sub-atomic fields. Just as in the case of early and present chemical agents and gases, the Chemical Warfare Service led the world in research into detective and protective devices, so now we look to that same leadership to develop even better protection from the toxic gases and other injurious emanations from the physio-chemical reaction of specific elements.

I trust that the Chemical Warfare Journal will prove instructive and stimulating to all those interested in the scientific aspects of national defense. It can be a bond with civilian industrialists and technicians and help keep them familiar with the scientific problems and trends of our new Army. At the same time it should enable our reserve components to increase their military knowledge of scientific developments.

I extend my best wishes to the Chemical Warfare Association on the publication of the Journal. May it achieve the patriotic ends for which it has been founded.

ROBERT P. PATTERSON,
Secretary of War.

GENERAL WAITT

(Continued from page 10)

ments which will go to make up the chemical defense of our nation in time of war. You can help make it possible to mobilize these elements with a minimum of delay and a maximum of efficiency.

The essential mission of an army in time of war is to impose the nation's will upon the enemy. The Chemical Corps is becoming an increasingly important factor in this mission as the art of warfare progresses. The development of warfare employing biological and chemical means rivals, if it does not actually exceed, the importance of the atomic bomb as a weapon in that it opens the way for conquering the enemy without destroying his property. This is important today in a closely knit world in which serious destruction of property and resources of one country affects all.

The warfare of the future is likely to be directed principally against the manpower of an enemy nation rather than against his machines and factories. The Chemical Corps must never relax its efforts to keep the United States ahead of the rest of the world in the entire field of chemical and biological defense and offense. In this great task it needs the interest, the understanding and the assistance of all the people of the country. Your organization stands as a principal means of obtaining this aid.

ALDEN H. WAITT
Major General
Chief of the Chemical Corps

GENERAL PORTER

(Continued from page 10)

The Association has a mission to perform which will require the interest, effort and active participation of all of its members. I extend to it my sincere greetings and very best wishes to its success.

WHY PREPARE?

(Continued from page 24)

our Army, Navy and Air Forces must keep industry fully informed as to its own developments and requirements. Funds must be allocated for contracts with private industry for research and development in all phases of military materiel. It is not sufficient to invent or devise the specific article for military use, but the development must continue on into the field of production so that the processes for mass production of all items are worked out, most important of all, tried out and proven. The last war taught us that comparatively little of our peacetime industrial equipment and machinery was suitable for the large scale production of the munitions of war. Therefore, adequate preparedness must include full scale pilot plants set up for highly mechanized production and the means worked out for duplicating these plants, at a rapid rate, in the event an emergency looms on the international horizon.

We must use to the utmost the brains and experience of our manufacturing industry in the working out of these full scale units, and coordinate with all agencies and private plants the necessary plans for immediate duplication and operation. This must, at all times, be up-to-the-minute because if we ever have to use it there will be *no time for change.*

Probably the greatest difficulty in "dynamic preparedness" is in having the courage to discard the obsolete. Even if full scale pilot plants have been established and everything worked out to the final detail, we must be prepared to scrap them and not question the cost of doing it. The only "fixed" thing about such a program of constant preparation is "change". We must never allow the *status quo* to prevail, never permit the existence of material, equipment or plans to influence us in any way by slowing up our search for new things.

Again, let it be emphasized—to be prepared is an insurance against war and for peace. To undertake such a program will make a terrific demand on our political structure. It will require constant salesmanship on the part of our military commanders to convince the body politic that such preparedness is the only assurance of peace; call for high moral courage on the part of our political leaders to support a program of public expenditures for war while the country is at peace and, above all, an understanding by the taxpayer that it is either this—or chaos and complete destruction of our civilization.

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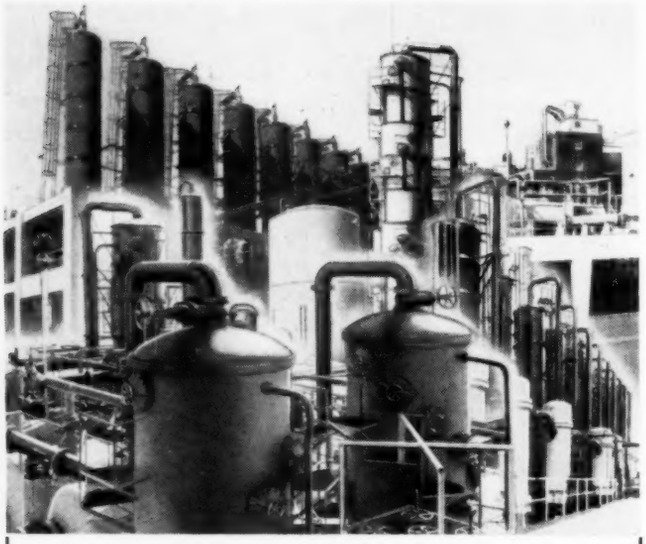

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BIOLOGICAL WARFARE

(Continued from page 50)

mineral deposits, but are obtainable in quantity in virtually every nation in the world. Also, the basic techniques of medical science and bacteriology are widely disseminated and available to all nations. It is possible, then, that small or poor nations that do not have the raw materials, or the nuclear physicists, or the economic capacity to construct tremendous plants such as those at Oak Ridge, can still produce biological weapons.

Secondly, it is possible to disguise biological warfare research and production as it is not possible with the atomic bomb. Biological weapons could be manufactured in the research laboratries, in the hospitals, in the universities, and in the brewing and fermentation plants of any nation. However, it may be possible to supervise research in atomic materials because of the highly specialized nature of this work, and because of the unusual materials and equipment necessary, this cannot be done with biological weapons. To do so it would be necessary to supervise the entire medical and biological researches carried on throughout the world.

(Another article on Biological Warfare by Mr. Hayward will appear in the next issue of *The Journal*.)

COLONEL KING

(Continued from page 34)

Advance Schools at Edgewood Arsenal, and the General Staff and Command School at Ft. Leavenworth, Kans. In England and Normandy, he served as Chemical Officer of the VII Corps on the staff of General J. Lawton Collins. His brother, Col. Charles King, was G2 of the same Corps.

Learning on the night of June 22 that his brother was missing beyond the front line, he went to search for him. His jeep struck an antitank mine, which caused his hospitalization and evacuation.

Colonel King, now returned to civilian life, is the Washington Manager of the Owens Corning Fiberglas Corp., and lives with his wife Betty and two sons, Jerry and Ludlow III, in Chevy Chase, D. C. He is an ardent supporter of the Army, believes in facing facts with force, and devotes much of his free time to the welfare of our Army.

COLONEL KUHN

(Continued from page 35)

Gas Investigation Branch of the Bureau of Mines, and holds a number of patents, principally on improvements in the gas mask, some of which have had wide commercial utilization.

Colonel Kuhn was commissioned 1st Lieutenant, Chemical Warfare Service, when that branch was organized in the latter part of 1918, and remained in the Research Division for the next ten years as Chief, Department of Toxicology, and Assistant Chief, Medical Research Division, first at American University and later at Edgewood.

After graduating from the Army Industrial College in 1931, Col. Kuhn was assigned to industrial mobilization duty in the Chemical Warfare Service and served for 12 years, chiefly in the chemical industry. He was stationed for 4 years in Chicago, where he became intimately acquainted with the chemical industry of the Middle West and Mississippi Valley. He was then stationed for 4 years in New York, where he was when war occurred. He was instrumental in the organization of the Chemical Advisory Committee of the Army-Navy Munitions Board, and served as Assistant to the Chairman of that Committee from its organization in 1938 until his recent relief from duty. Colonel Kuhn was responsible for consolidating in New York all chemical procurement for the Chemical Warfare Service, which previously had been scattered throughout the United States in seven different offices.

In 1942 Colonel Kuhn was transferred to the Office of the Chief, Chemical Warfare Service, where he served for 4 years as Chief of Control Division and technical adviser to the Chief, Chemical Warfare Service.

He was retired for physical disability and started terminal leave August 17, 1946.

CWA OBJECTIVES

(Continued from page 16)

active participation in our association of Regular Army personnel. Our laws, however, prohibit the holding of any office on our Executive Committee by any person on active duty. I have repeated that particular phase of our activities last night and am repeating it again today so that our members will have no misconception of that particular phase of our organization. This association belongs to you people in mufti. The direction, the responsibility, is yours and mine. Guide it and guard it accordingly.

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Were Japs Defeated by CWS Incendiaries?
(Continued from page 41)

post-war Tokyo and Yokohama were the stacks of burned-out M-69 casings piled twice as high as a tall man's head outside fire stations. Col. S. E. Whitesides, Jr., who helped procure M-69's as commanding officer first of the Boston Chemical Warfare Procurement District and then the New York District, was photographed with the fire chief of a fire station near Tokyo. Behind them stood log-cabinish stacks of M-69 bombs as a fitting background.

An interview was held between Col. Whitesides and the blue-uniformed fire chief who was a perfect caricaturist's dream of a moon-faced, gold-toothed, grinning Jap gargoyle.

No one could be quite sure of the phraseology used by the Jap chief in reply to the colonel's questioning about fire-bomb damage and Japanese fire-fighting techniques and their success. But there was no mistaking from his answers and from the looks of the literally hundreds of his sycophantic underlings pressing around that he thought the incendiary bomb was the most devilish thing anyone ever thought up to torment the traditionally overworked Jap fireman.

The little fire chief would listen to the interpreter repeat Col. Whitesides' questions. Then he would stretch his smile even wider, shake his head slowly and sadly, and thrust out his outstretched palms as if to say "what could we do?".

"At one time," he said, "there were 10,000 fires burning at the same time in Tokyo. Buildings went up like tinder boxes."

Nor were his answers needed to confirm the fact that was there for all to see. All of Japan's firemen and all of the Emperor's horses and men couldn't have saved the industrial house that the CWS fire-bombs burned down.

Peacetime Implications of Biological Warfare
(Continued from page 40)

their programs ready. But they need support—support from scientists, academic and industrial, which should be given generously and in full measure—and it should not wait for an emergency call of patriotism.

There must be support from people through Congress and its proper committees. That means money for research. If anything is sure about such an investment, it is that it will pay large dividends—dividends for the nation's health and for the country's economy.

Above all, there should be careful and serious consideration of the subject in whatever deliberations take place concerning the implementation of a lasting peace in the world. *The potentialities of this type of warfare cannot be ignored.* This is the most important peacetime implication of Biological Warfare.

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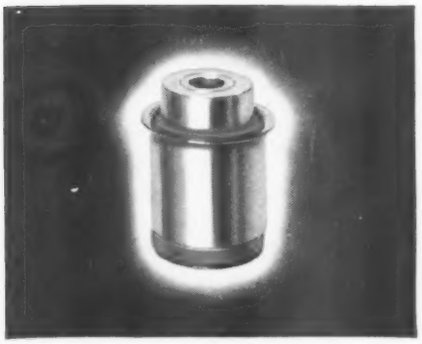

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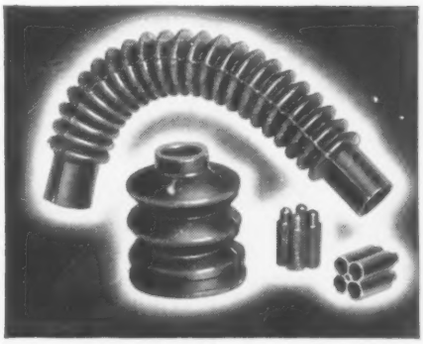

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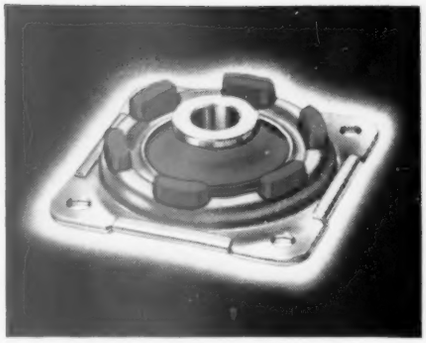

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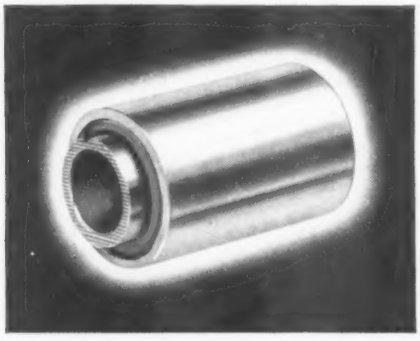

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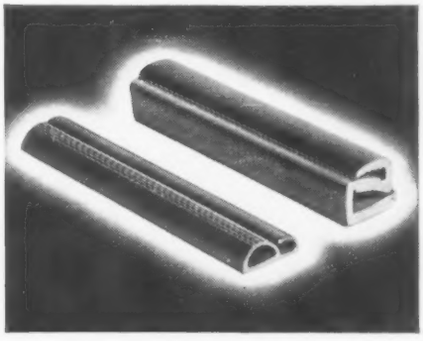

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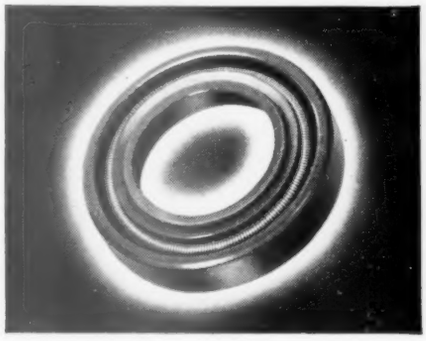

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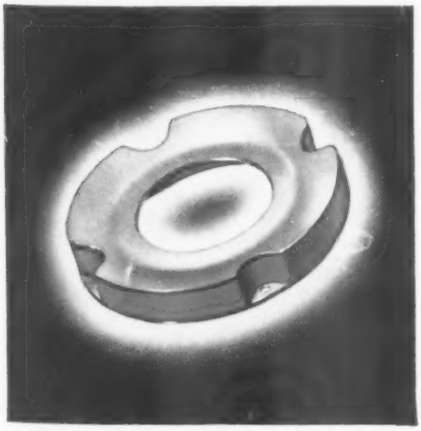

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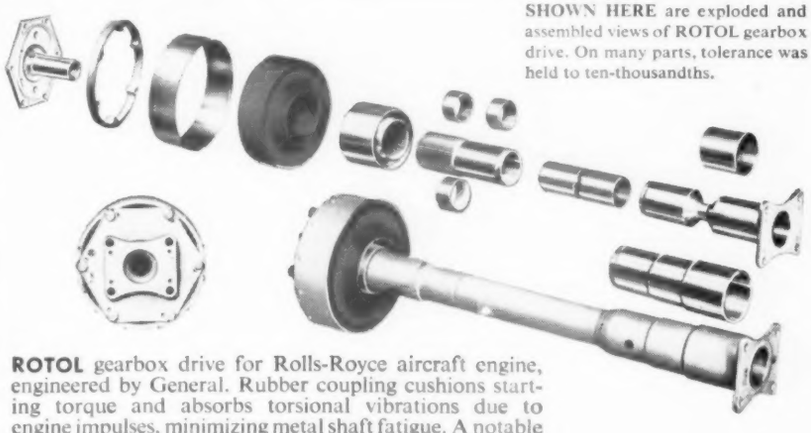

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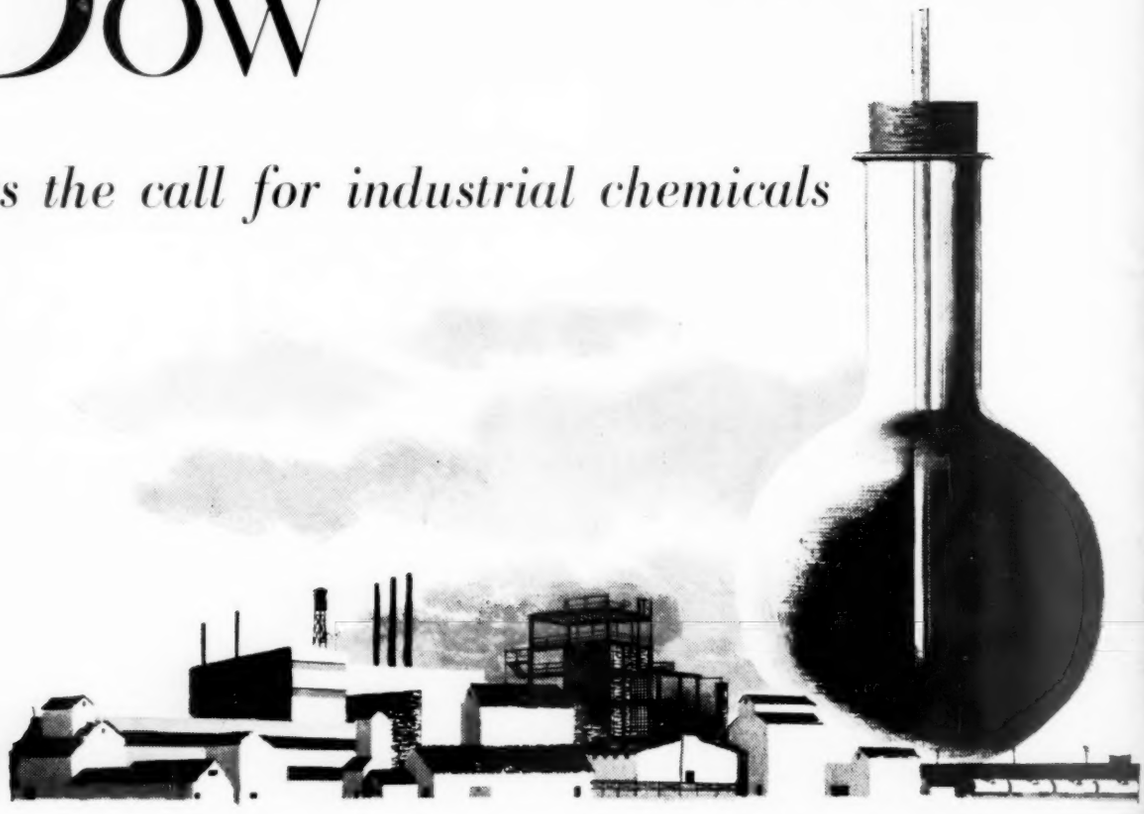

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